688 Peninsula Road

Project Specification

688 Peninsula Road, Kelvin Heights, Queenstown, New Zealand
Project Ref: j24139
Date: 21 September 2026



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

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TABLE OF CONTENTS

1220	PROJECT	4
1232	INTERPRETATION & DEFINITIONS	6
1232S1	EXPLANATION OF SCHEDULE SECTIONS	8
1233	REFERENCED DOCUMENTS	9
1234	DOCUMENTATION	10
1238	AS BUILT DOCUMENTATION	15
1238S1	SCHEDULE OF AS BUILT DOCUMENTATION	16
1240	ESTABLISHMENT	17
1250	TEMPORARY WORKS & SERVICES	19
1270	CONSTRUCTION	23
2110	DEMOLITION WORKS	31
2133	TEMPORARY SUPPORT TO EXISTING STRUCTURES	34
2210	PREPARATION & GROUNDWORK	37
2310	FOUNDATIONS	41
2362	FOUNDATION WALLS	44
3101	CONCRETE WORK - BASIC	49
3320	CONCRETE MASONRY	54
3410	STRUCTURAL STEEL	59
3415	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL	65
3820	CARPENTRY	69
3897	REPLACEMENT & TREATMENT OF DECAYED TIMBER	73
4131	BITUTHEN AND PREPRUFE MEMBRANE TANKING SYSTEM	78
4161	UNDERLAYS, FOIL AND DPC	87
4221JW	JSC THERMALLY MODIFIED TIMBER VERTICAL WB	91
4231HA	JAMES HARDIE AXON™ PANEL CLADDING	97
4239JH	JAMES HARDIE® SOFFITS	103
4311ME	METALCRAFT ESPAN ROOFING	106
4383	TIMBER DECKING	111
4521	ALUMINIUM WINDOWS AND DOORS	113
4554	SKYLIGHTS	121
4610	GLAZING RESIDENTIAL	125
4710P	PINK® BATTS® THERMAL & ACOUSTIC INSULATION	129
4855JG	JURALCO GLASS BALUSTRADE SYSTEMS	133

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5113	PLASTERBOARD LININGS	138
5120	LININGS	144
5230	INTERIOR DOORS	147
6122A	ARDEX FLOOR SUBSTRATE PREPARATION	149
6221A	ARDEX FLOOR TILING SOLUTIONS	152
6700	PAINTING GENERAL	159
6711	PAINTING EXTERIOR	165
6721	PAINTING INTERIOR	166
7120	HOT & COLD WATER SYSTEM	167
7150	SANITARY FIXTURES, TAPWARE & ACCESSORIES	174
7352	TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS	177
7411M	METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS	180
7420	SANITARY SYSTEMS	183
7430	DRAINAGE	185
7545	UNDERFLOOR HEATING	189
7701	ELECTRICAL BASIC	193
8420	MISCELLANEOUS SITE WORKS	201

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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

Renovation of Existing Single Storey House. Subfloor to be built out and become lower storey. All cladding to be removed and replaced except for around garage area (refer to Architectural Plans for extent). Existing backing board to plaster cladding to be retained for bracing.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

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

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS

Site hazards known to the principal are:

None known.

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site

1.7 SITE

The site consists of: Steep slope facing south to the lake.
As shown on drawing: Sheet 301 -304

1.8 LEGAL DESCRIPTION

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

1.9 EXISTING BUILDINGS

Existing buildings consist of:	Direct fixed plaster cladding over fibre cement sheet backing board. Light blue corrugate roofing.
Refer drawing(s):	301 -302

1.10 EXISTING SERVICES

The following are the network utility services:

Electrical:	mains, unknown connection point
Communications:	unknown
Water:	mains, unknown connection point
Gas:	cylinders for fire, located at south end of house, to be relocated.

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Stormwater:	two soakpits on site, north lawn and south lawn. To be relocated (new pit dug) as shown on sheet 205
Foul water:	mains, connection runs along south property boundary.

The services are also shown on the drawings.

1.11 SITE FEATURES

none.

Site environment - Durability

1.12 EXPOSURE ZONE

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

The site zone is: B

Site environment - Wind

1.13 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 HIGH (refer to NZS 3604, table 5.4)

Site environment - Seismic

1.14 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.

The earthquake zone is: 3

Archaeological discovery

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

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

Definitions

1.1 DEFINITIONS

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

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

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

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

1.4 DEFINED WORDS

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

1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

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

1.1 EXPLANATION OF SCHEDULE SECTIONS

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

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

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

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

1238S1 Schedule of As Built Documentation

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1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

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

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

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

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

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4781	Code of Practice for Safety in Welding and Cutting
AS/NZS 5131	Structural steelwork - Fabrication and erection
NZS 6803	Acoustics - Construction Noise

Building Act 2004
Building Regulations 1992
Health and Safety at Work Act 2015
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016
Health and Safety at Work (Hazardous Substances) Regulations 2017
Health and Safety in Employment Regulations 1995
New Zealand Building Code
Heritage New Zealand Pouhere Taonga Act 2014
Resource Management Act 1991
Smoke-free Environments Act 1990

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

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1234 DOCUMENTATION

1 GENERAL

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

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

Building Consent Authority documentation

1.1 BUILDING CONSENT

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

1.2 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004

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

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

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

1.3 PROJECT PERSONNEL

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

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information. Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LBP previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Foundations 2 Concrete or timber pile foundations constructor
- Bricklaying and block laying 1 Brick / masonry veneer
- Bricklaying and block laying 2 Structural masonry - Bricklayer / Blocklayer
- Roofing 1 Concrete / clay tile roofer
- Roofing 2 Profiled metal roofer and/or wall cladding installer
- Roofing 3 Metal tile roofer
- Roofing 4 Membrane roofer
- Roofing 5 Torch on membrane roofer
- Roofing 6 Liquid membrane roofer
- Roofing 7 Shingle / slate roofer
- External plastering 1 Solid plasterer
- External plastering 2 Proprietary Plaster Cladding Systems (PPCS) plasterer

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Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered gasfitter
- Registered electrician

1.5 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

Compliance information

1.6 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

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

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

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

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

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

1.7 PRODUCER STATEMENTS

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

Residential building contract

1.8 CHECKLIST

If requested provide evidence of the prescribed checklist given to the residential client.

1.9 DISCLOSURE STATEMENT

If requested provide evidence of the disclosure statement given to the residential client.

1.10 BUILDING CONTRACT

If requested provide evidence of the written building contract that the residential customer has signed.

1.11 DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

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Substitutions

1.12 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.

1.13 NO SUBSTITUTIONS

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

1.14 PROPOSED SUBSTITUTIONS

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

1.15 NOTIFICATION OF SUBSTITUTIONS

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

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

Plus an assessment of:

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

and if requested:

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

1.16 ACCEPTANCE OF SUBSTITUTIONS

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

Amendments to issued Building Consent

1.17 CONTRACTOR AMENDMENTS TO BUILDING CONSENT

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

The contractor must:

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

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1.18 PRINCIPAL AMENDMENTS TO BUILDING CONSENT

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

The principal will:

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

Manufacturer's documents

1.19 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

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

1.20 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

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

1.21 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

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

Branded work sections

1.22 BRANDED PRODUCTS / SYSTEMS

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

1.23 CROSS REFERENCED WORK SECTIONS

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

Care of construction documents

1.24 CONSTRUCTION ISSUE

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

1.25 REVISIONS TO CONSTRUCTION ISSUE

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

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

1.26 RETURN DOCUMENTS ISSUED FOR CONSTRUCTION

On completion of the contract works:

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

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or

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- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

Confidentiality of documents

1.27 CONFIDENTIALITY OF DOCUMENTS

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

2 SELECTIONS

Receipt of construction documents

2.1 DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS

Electronic documents issued for construction shall be

- Obtained as an email attachment sent to an agreed address or,
- Obtained from a file hosting service.

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1238 AS BUILT DOCUMENTATION

1 GENERAL

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

1.1 SCHEDULE SECTION

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

1.2 AS BUILT DOCUMENT REQUIREMENTS

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

As built drawings recording:

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

Records of:

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

1.3 PROVISIONAL AS BUILT DOCUMENTS

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

1.4 AS BUILT DOCUMENT REVIEW

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

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

1.5 COMPLETE AS BUILT DOCUMENTS

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

1.6 AS BUILT DOCUMENTS - ELECTRONIC COPY

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

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

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1238S1 SCHEDULE OF AS BUILT DOCUMENTATION

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

As built documents

1.2 AS BUILT DOCUMENTS

Refer to the following sections:

7430 Drainage

1.3 AS BUILT DOCUMENTS - ADDITIONAL ITEMS

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

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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

Existing roof structure is to be checked and confirmed once ceiling and/or roof has been opened up. Location of existing soak pits is to be confirmed prior to work commencing. Confirm location of all existing services prior to work commencing.

Site preparation

1.5 SITE ACCESS

Access to the site is limited to: driveway entry at 688 Peninsula Road.

1.6 WORKING AREA

Confirm with owner the working area and any provisions for on-site living while construction is underway.

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).

Existing buildings

1.8 ALTERATIONS

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

1.9 TEMPORARY ACCESS

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

Temporary construction

1.10 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.



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1.11 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.

1.12 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

1.13 SITE - PROJECT SIGN

Obtain approval to, provide and erect a timber framed sign board. 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

1.14 FIRST AID EQUIPMENT

Provide first aid equipment.



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1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 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

1.5 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

1.6 LIGHTING

Provide temporary lighting 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.

1.7 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.

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1.8 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.

1.9 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

1.10 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 works - Existing Buildings

1.11 OCCUPIED BUILDINGS

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

1.12 PARTITIONS

Provide and maintain full height temporary partitions, dust sealed and with appropriate access doors as required. Confirm with owner.

Construct the partitions from;

- timber or steel stud framing to suit the height
- 17mm CD plywood screw fixed to occupied side of wall only

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- paint plywood white, occupied side only

1.13 SCREENS

Provide and maintain 2.0m high temporary screens with appropriate access doors as required. Confirm with owner.

Construct the screens from;

- timber or steel stud framing
- 17mm CD plywood screw fixed to occupied side of wall only
- paint plywood white, occupied side only

1.14 DUST SCREENS

Provide and maintain full height temporary dust screens as required. Confirm with owner.

Construct the screens from;

- dust proof flexible membrane with taped joints
- timber battens for fixing membrane to edges of building fabric

Temporary services

1.15 WATER

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

1.16 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.

1.17 TELEPHONE

Provide on-site temporary telephone facilities.

1.18 COMPUTER FACILITIES

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

1.19 PRINTER

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

1.20 IMAGING

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

Care and protection - existing buildings

1.21 PROTECT EXISTING BUILDINGS

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

1.22 PROTECT ACCESS ROUTES

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

1.23 EXISTING FIRE SYSTEMS

Maintain the integrity of the systems at all times. If work requires de-activation of a system, give notice to the relevant Fire and Emergency NZ service. Follow their instructions and reinstate the system to their requirements.

1.24 MAKE GOOD - EXISTING BUILDINGS

Make good all damage to existing buildings caused in carrying out the contract works.

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Care and protection - Site

1.25 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.

1.26 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.

1.27 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.

1.28 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.

1.29 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

1.30 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.

1.31 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous

1.32 CONSTRUCTION KEYING AND SECURITY

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

1.33 TEMPORARY STORAGE

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

Rubbish removal

1.34 PERIODIC RUBBISH REMOVAL

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



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1270 CONSTRUCTION

1 GENERAL

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

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

1.1 SCHEDULE SECTION

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

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

Quality control and assurance

1.2 QUALITY ASSURANCE

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

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

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

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

1.3 NOTICE

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

1.4 NOTIFIABLE WORK

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

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Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

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

1.6 ACCEPTABLE NOISE LEVELS

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

1.7 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.8 INCONVENIENCE TO OTHERS

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

1.9 ROADWAY AND FOOTPATH

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

1.10 VEHICLE CROSSING

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

1.11 TRAFFIC SAFETY

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

1.12 DIRT AND DROPPINGS

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

1.13 DAMAGE AND NUISANCE

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

1.14 SMOKE FREE REQUIREMENTS

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

1.15 RESTRICTIONS

Do not:

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

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- bring radios/audio players on to the site.

Set-out and tolerances

1.16 SURVEY INFORMATION

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

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

1.17 DATUM

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

1.18 SET-OUT

Set out the work to conform with the drawings.

1.19 USE OF SET-OUT INSTRUMENTS

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

1.20 CHECK DIMENSIONS

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

1.21 TOLERANCES

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

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

Refer to work sections for tolerance requirements for finishes.

Execution

1.22 EXAMINE PREVIOUS WORK

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

1.23 REPORT DEFECTIVE PREVIOUS WORK

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

1.24 EXECUTION GENERALLY

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

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1.25 EXECUTION - NO DETAIL IS PROVIDED

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

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

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

1.26 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

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

1.27 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.28 DEFECTIVE OR DAMAGED WORK

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

Hot work - fire safety

1.29 HOT WORK

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

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

1.30 COMBUSTIBLE MATERIAL

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

1.31 HOT WORK PERMIT

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

1.32 FIRE SYSTEMS

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

1.33 DURING SUSPENDED WORK

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

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

Qualifications

1.34 QUALIFICATIONS GENERALLY

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

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1.35 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

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

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

1.36 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

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

1.37 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.38 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

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

1.39 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.40 REPLACEMENT OF PERSON

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

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

Products

1.41 NEW PRODUCTS

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

1.42 COMPATIBILITY OF PRODUCTS

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

1.43 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

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

Refer to individual work sections for any special requirements.

1.44 SUBSTRATE CONDITIONS

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



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1.45 INSTALLING PRODUCTS

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

1.46 COMPLY WITH STANDARDS

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

1.47 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.48 INCOMPATIBLE PRODUCTS

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

Cleaning during the works

1.49 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.

1.50 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.

Remove protection

1.51 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

1.52 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.53 LEAVE WORK

Leave work to the standard required for the following procedures.

1.54 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.

1.55 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.

1.56 COMPLETE ALL SERVICES

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



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1.57 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.

1.58 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

1.59 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.60 MOVING PARTS

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

1.61 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.

1.62 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.

1.63 SECURITY AT COMPLETION

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

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Practical completion submission

1.64 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.

Defects period submissions

1.65 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

1.66 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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2110 DEMOLITION WORKS

1 GENERAL

This section relates to the demolition of existing buildings and structures in whole or in part, to the extent necessary to carry out the new work.

1.1 RELATED WORK

Refer to 2133 TEMPORARY SUPPORT TO EXISTING STRUCTURES for lifting and temporary support of existing structures

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC F5/AS1	Construction and demolition hazards
NZS 6803	Acoustics - Construction noise
NZDAA	Best practice guidelines for demolition in New Zealand
WorkSafe	Management and Removal of Asbestos (Approved CoP)

Health and Safety at Work Act 2015
Health and Safety at Work (Asbestos) Regulations 2016

Requirements

1.3 QUALIFICATION

Carry out demolition only under the supervision of a suitably experienced person and using only experienced operators and drivers. Use only experienced, certified/licensed, construction blasters for explosives demolition.

1.4 NOISE

Refer to NZS 6803, tables 2 and 3 for the allowable upper limits of construction work noise in residential, commercial and industrial areas over the various time periods. Use silenced and noise insulated plant to ensure compliance with these requirements.

1.5 NUISANCE

Take all precautions necessary to minimise nuisance caused by dust, dirt, rubbish and water.

1.6 HEALTH AND SAFETY

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

1.7 BUILDING CONSENT REQUIREMENTS

Demolition work to be carried out to building consent requirements

1.8 INSPECTIONS

Inspection of the demolition work to take place at each of the stages as scheduled in the building consent. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection. Allow 48 hours advanced notice for the inspections.

Obtain and pay for any required inspections which are additional to the building consent.

1.9 SURVEY

Before commencing work, carry out a thorough survey and examination of all buildings or structures to be demolished in order to ensure the extent, sequence, technique and method of demolition proposed can be safely and efficiently carried out.

Take photographs of the works, adjacent buildings and sites, before commencing work. Provide a set of these photographs as a record of existing condition.

1.10 SERVICES

Before commencing demolition, arrange with all utility network operators to disconnect services and remove fittings and equipment. Pay all fees and charges for this work.

1.11 MATERIAL

Material from the demolition becomes the property of the contractor except where expressly provided otherwise. Remove redundant materials from the site as work proceeds.

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1.12 SALVAGE

Designated items remain the property of the owner.

1.13 BURNING OF MATERIALS

Burning of materials is not permitted on site.

1.14 HOT WORK - FIRE SAFETY

Refer to 1270 CONSTRUCTION

2 PRODUCTS

2.1 ELEMENTS FOR SALVAGE OR RE-USE

Carefully dismantle, remove and store on site where directed. Protect from damage and weather until required.

3 EXECUTION

3.1 DEMOLITION GENERALLY

Comply with the requirements of NZDAA Best practice guidelines for demolition in New Zealand. Submit a written demolition plan to the requirements of section 4.7, Demolition plan (method statement).

3.2 PROTECT

Protect retained parts of existing buildings, the site and site structures, trees and shrubs. Take care in the cutting away and stripping out to reduce the amount of making good.

3.3 SUPPORT

Support and brace the existing structure during the cutting of new openings or the replacement of structural parts. Prevent debris from overloading any part of the structure. Do not remove supports until the new work is strong enough to support the existing structure. Ensure all work remains structurally stable and sound.

3.4 TEMPORARY SCREENS

Erect approved screens wherever penetration of weather, dust and dirt needs to be prevented. Adjust screens as work proceeds.

3.5 SITE SAFETY

Prevent access by unauthorised persons. Illuminate and protect all holes, unsafe buildings and other hazards. Leave site and buildings safe at the close of each day's work.

3.6 FLAMMABLE OR EXPLOSIVE CONDITIONS

Prevent fire or explosion and arrange to alert the appropriate authority where any danger exists.

3.7 DEMOLISH

Demolish all existing cladding where shown on Architectural Plans with care to retain existing backing board. Demolish internal walls, joinery, fittings and fixtures as shown on sheet 201 & 203 and allow to make good again areas that are affected by these works. Do not remove support to adjacent properties or buildings.

3.8 HOUSE LIFTING

Carry out house lifting for either excavating under, or for relocation, to the general requirements of the NZDAA publication: Best Practice Guidelines for Demolition in New Zealand, 5.7 Temporary supports for removal or excavation under, including the precautions required during jacking and pigsty construction.

3.9 DEMOLITION, ASBESTOS

Where demolition work includes contact with or removal of material containing asbestos, comply with, Health and Safety at Work (Asbestos) Regulations 2016, WorkSafe requirements including WorkSafe Management and Removal of Asbestos (Approved CoP), and NZBC F5/AS1.

3.10 SALVAGE

Carefully dismantle and store safely all salvage items where directed; for removal, use on the site, or until completion of the works.



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3.11 REINSTATE AND MAKE GOOD

Reinstate and make good demolition damage to adjoining properties, existing work, services, or property.

3.12 TAKE AWAY

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

4 SELECTIONS

4.1 ELEMENTS FOR DEMOLITION AND DISPOSAL

Element/component	Location
Refer to Architectural plans	

4.2 ELEMENTS FOR SALVAGE AND DISPOSAL BY CONTRACTOR

Salvage the following elements.

Element/component	Location	Disposal requirements
none.		

4.3 ELEMENTS FOR RE-USE

Element/component	Location	Location for re-use
Refer to Architectural plans for item like wardrobe doors noted on sheet 204. Confirm with owner any other items before commencing work. Existing gas fireplace and joinery in living area is to be retained. Protect this area from damage and reinstate flue as shown on sheet 404 with extender kit.	living area, bedroom.	same



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2133 TEMPORARY SUPPORT TO EXISTING STRUCTURES

1 GENERAL

This section relates to the temporary support of houses and similar existing structures during lifting for the construction of a new ground floor and for re-piling
It includes requirements for the management of adjacent site conditions

1.1 RELATED WORK

Refer to 2110 DEMOLITION WORKS for partial demolition of existing buildings and structures

Documents

1.2 DOCUMENTS REFERRED TO

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

NZBC F5/AS1	Construction and demolition hazards
NZDAA	Best Practice Guidelines for Demolition in New Zealand
Worksafe	Good Practice Guidelines - Scaffolding in New Zealand

Health and Safety at Work Act 2015

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

Requirements

1.3 QUALIFICATIONS

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

1.4 DEMOLITION PLAN

Submit detailed written and/or drawn demolition and temporary support plan.

Quality control and assurance

1.5 INSPECTIONS

Inspect the area to be supported and confirm position for beams and pigsties to enable subsequent work to be carried out.

2 PRODUCTS

Materials

2.1 PIGSTIES

Timber bearers not less the 200mm x 100mm x 900mm in sound conditions with true faces to support the required loads.

2.2 ADJUSTABLE PROPS

Proprietary steel tube adjustable props. Ensure loadings are within Safe Working Limits (SWL) in accordance with the manufacturer's specifications and to the requirements of Worksafe, Good Practice Guidelines - Scaffolding in New Zealand, clause 13.4.

2.3 LIFTING JACKS AND BASEJACKS

Proprietary hydraulic and mechanical jacks. Ensure loadings are within Safe Working Limits (SWL) in accordance with the manufacturer's specifications and to the requirements of Worksafe, Good Practice Guidelines - Scaffolding in New Zealand clause 13.4.

2.4 HEADER BEAMS

That may be used include the following:

- Timber beams
- Rolled steel joists (RSJ)



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- Universal beams (UB)
- Composite beams
- Laminated beams
- Aluminium ‘A’ or ‘I’ beams with timber infill
- Steel soldier beams

Use in accordance with the manufacturer’s specifications and to the requirements of Worksafe, Good Practice Guidelines - Scaffolding in New Zealand, clause 13.4

3 EXECUTION

Conditions

3.1 SAFETY

All work to comply with WorkSafe requirements, NZBC F5/AS1 and Health and Safety at Work Act 2015.

3.2 CONFIRM SITE SECURITY

Check site security arrangements both at the perimeter of the site and immediately adjacent to the area in which the temporary support is being carried out

3.3 SUPPORT

Support and brace the existing structure during the cutting of new openings or the replacement of structural parts. Prevent debris from overloading any part of the structure. Do not remove supports until the new work is strong enough to support the existing structure. Ensure all work remains structurally stable and sound.

3.4 CHECK MATERIAL SUPPLIES

Confirm sufficient materials are available to enable the work to be safely carried out. Check and confirm: -

- Timber for use as pigsties
- Support beams and bearers
- Adjustable props, rope and wedges
- Lifting jacks

3.5 PROHIBIT OPERATION OF HEAVY MACHINERY

Ensure that no heavy machinery is operating in the immediate vicinity of the building until the building has been safely placed on the temporary supports

Installation/application

3.6 LIFTING

Carry out lifting for either excavating under, or for relocation, to the general requirements of the NZDAA publication: Best Practice Guidelines for Demolition in New Zealand, Section 5.7 Temporary support for removal or excavation under, including the precautions required during jacking and pigsty construction.

3.7 DISCONNECT SERVICES

Disconnect all services necessary prior to lifting the building.

Re-direct roof water downpipes away from the work area.

3.8 CHECK GROUND CONDITIONS AT JACKING POINTS

Check ground conditions at each lifting point. Ensure ground is level, has suitable bearing capacity and is otherwise free of loose and unsuitable material

3.9 PLACE TEMPORARY BEAMS FOR JACKING

Place support beam and bearers in positions to adequately support the structure and to allow for required construction work below the supported structure.

3.10 CONSTRUCT TEMPORARY SUPPORTS

Construct temporary supports progressively during lifting proceed so as to minimise damage from any premature collapse. Limit height of temporary supports to not more than 3 times the minimum base width. Ensure supports remain vertical and that the loads are supported evenly on them.

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3.11 JACK BUILDING

Jack building evenly to WorkSafe requirements and build support structure progressively as the building is lifted

3.12 COMPLETE TEMPORARY SUPPORT

When the building is at the required height, construct temporary braces or inclined props to provide adequate support against wind and earthquake loads.

Completion

3.13 ROUTINE CLEANING

Clear our building debris and other material from the work area below the supported structure. Keep area clear of materials not required for subfloor work

3.14 CHECK SUPPORT STRUCTURE

Carry out daily check of the temporary support structure to ensure safe working conditions for both workers working below the supported structure and for any workers carrying out work above the supported area.

3.15 PROTECTION

Provide standard temporary protection to finished works including walls, floors and joinery as needed.

3.16 LOWER STRUCTURE ON TO NEW PERMANENT SUPPORT

Lower evenly on jacks progressively removing temporary supports, so as to minimise damage from any premature collapse

3.17 REMOVE TEMPORARY SUPPORTS

Once structure is on the permanent supports, fully supported, stable and secure, remove temporary supports and related items.



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2210 PREPARATION & GROUNDWORK

1 GENERAL

This section relates to the clearance, excavation and backfilling of the site area in preparation for:

- footings and floor slabs
- backfilling behind basement retaining walls

Documents

1.1 DOCUMENTS

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

NZS 3604	Timber-framed buildings
WorkSafe	Good Practice Guidelines - Excavation Safety

1.2 SITE SAFETY

Provide adequate support for all excavations. Cover holes and fence off open trenches and banks.

1.3 ARCHAEOLOGICAL DISCOVERY

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



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2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

Clean, free of contamination, mineral soil from other formations in the excavation which may be selected and approved as suitable for filling by having grading and moisture content properties that will allow recompaction to 95% of maximum density.

2.2 VOLCANIC TUFF FILL

Scoriaceous tuff of variable grading excluding excessive silt or clay material, capable of being placed and compacted as specified.

2.3 ROCK FILL

Hard material comprising rock, broken stone, hard brick, concrete, run of pit scoria, or other comparable inert material capable of being placed and compacted as specified.

2.4 SAND FILL

Clean sand of such grading in particle size to achieve mechanical compaction to 90% maximum density.

2.5 HARD FILL

Scoria or crushed rock to GAP (General All Passing) 40 grading.

2.6 GRANULAR FILL

Approved screened crushed gravel or scoria, graded in size from 20mm to 7mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.

2.7 DRESSING COURSE

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

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

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3 EXECUTION

3.1 WASHOUT BAY FOR TRUCK

Provide a designated area for trucks to be washed down to avoid mud and dirt being carried off site.

3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained.

3.5 PROTECT EXISTING TREES, PLANTING, OR LANDSCAPE FEATURES

Protect from damage trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained. Ensure existing levels are undisturbed beneath the dripline of retained trees.

3.6 EROSION CONTROL

Ensure measures are in place to contain silt dislodged as a result of water infiltration and to prevent it being carried off site with stormwater.

3.7 SURFACE PREPARATION

Comply with NZS 3604, section 3.5, **Site preparation**. Remove all turf, vegetation, trees, topsoil, stumps, uncontrolled fill and rubbish from the area to be built on.

3.8 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove old foundations, slabs, drainage pipes, manholes, tanks, cables and redundant services. Report for instructions when any unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.

3.9 STOCKPILE TOPSOIL

Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.

3.10 GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

3.11 ROCK EXCAVATION

If rock is found at any level above the underside of the structural foundations, or above required base levels for site service trenches, immediately notify the owner. Obtain written instructions from the owner on the proposed approach to rock excavation, or consequent alterations to subgrade construction. Confirm any changes with the territorial authority.

3.12 FOUNDATION EXCAVATION

Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and free of soft spots, stepped as detailed and clean and free of water.

3.13 INADEQUATE BEARING

If localised bearing is not to NZS 3604, 3.1.2 **Foundations** and 3.1.3 **Determination of good ground**, then excavate further and backfill with material as follows:

- Below slabs on grade: Hardfill compacted in 150mm layers
- Below footings: 10 MPa concrete

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.
Confirm any changes with the territorial authority.
For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

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3.14 STANDARD OF COMPACTION

Place fill in layers of not more than 150mm and compact to achieve 95% of maximum dry density. For granular fill material, the fill shall be compacted to 80% of saturated dry density.

3.15 GENERAL BACKFILLING

Obtain written confirmation from the owner before using any excavated material. Compact approved backfilling in 150mm layers with the last 200mm in clean topsoil, lightly compacted and neatly finished off.

3.16 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200mm layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing are not damaged.

3.17 SURPLUS MATERIAL

Remove surplus and excavated material from the site.



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2310 FOUNDATIONS

1 GENERAL

This section relates to all foundation and piling work, with the exception of in situ concrete work and concrete masonry.

1.1 RELATED WORK

Refer to 2362 FOUNDATION WALLS for concrete and masonry foundation walls.

Refer to 3101 CONCRETE WORK - BASIC for concrete slab and related combined footings, DPM etc

Refer to Concrete Masonry section for concrete block foundation walls.

Documents

1.2 DOCUMENTS

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

NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3605	Timber piles and poles for use in buildings

Performance

1.3 INSPECTIONS

Give notice to Engineer and contract administrator, at least 24 hours prior to foundation inspection being required. At inspection foundation to be clear of obstructions like, backfill, site concrete and reinforcing.



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2 PRODUCTS

2.1 CONCRETE PILES IN SITU

To NZS 3604 for concrete, reinforcement, footing and type.

2.2 CONCRETE PILES PRE-CAST

200mm square parallel-sided to NZS 3604 for footing and type.

2.3 ROUND TIMBER PILES

Corsican pine or radiata pine, treated H5 CCA (preservative code 01 or 02) to NZS 3602, table 1A, and complying with NZS 3605 for cross section, length, straightness, strength and branding. All to NZS 3604 for footing and type.

2.4 SQUARE TIMBER PILES

Corsican pine or radiata pine, treated H5 CCA (preservative code 01 or 02) to NZS 3602, table 1A, and complying with NZS 3605 for cross-section, length, straightness, strength and branding. All to NZS 3604 for footing and type.

2.5 TIMBER SUB-FLOOR FRAMING

Species, grade, moisture content in service and level of treatment as set out in NZS 3602. Grading to NZS 3603 and treated to NZS 3602, table 1C.

2.6 NAILS

Steel, stainless steel and galvanized steel of pattern to NZS 3604, table 6.6 **Nailing schedule for hand-driven and power-driven nails** and section 4 Durability.

2.7 BOLTS

Steel, stainless steel, and galvanized steel to NZS 3604.
Refer to SELECTIONS.

2.8 NAIL PLATES

Stainless steel and galvanized steel toothed or nailed steel plates to the plate manufacturer's design for the particular locations shown on the drawings.

2.9 CORROSION RISKS

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).

2.10 CONCRETE

For piles and footings, 17.5 MPa prescribed mix concrete to NZS 3104, section 3, and cover to reinforcing to NZS 3604, 4.5.1, generally 50mm, against ground 75mm. Provisions for prescribed mix concrete, and NZS 3604, section 6.4.5, Pile footings.

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3 EXECUTION

3.1 FOUNDATIONS GENERALLY

Comply with NZS 3109, 3602 and NZS 3604 except as varied by 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 EXCAVATIONS

Refer to 2210 PREPARATION AND GROUNDWORK.

3.3 INSTALL CONCRETE PILES IN SITU

Box for, reinforce and pour in 17.5 MPa concrete the footings and piles in the various types to NZS 3604.

3.4 INSTALL CONCRETE PILES PRECAST

Pour 17.5 MPa concrete footing and set in pre-cast concrete piles in the various types to NZS 3604.

3.5 INSTALL ROUND TIMBER PILES

Prepare for and drive timber piles to NZS 3604, section 6.6, **Driven timber piles**. Protect pile heads with a suitable cushion.

3.6 INSTALL SQUARE TIMBER PILES

Prepare for, place and secure as detailed on the drawings.

3.7 SUB-FLOOR FRAMING

Frame up off foundation walls and piles, all fabricated, fastened and braced to NZS 3604, section 6, **Foundation and subfloor framing**.



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2362 FOUNDATION WALLS

1 GENERAL

This section relates to the supply and installation of concrete and concrete masonry foundation walls to NZS 3604, including;

- formwork, reinforcement, concrete mixes and the placing of concrete
- concrete masonry, mortar, reinforcement and grouting
- separate concrete masonry foundation walls supporting concrete slabs

1.1 RELATED WORK

Refer to 2361 STRIP FOOTINGS for simple strip footings.

Refer to the appropriate timber framing section for sub-floor timber framing.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

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

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZS 3101.1	Concrete structures standard
NZS 3103	Sands for mortars and plasters
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4455.1	Masonry units, pavers, flags, and segmental retaining wall units - Masonry units
AS/NZS 4671	Steel reinforcing materials

Requirements

1.4 QUALIFICATIONS - MASONRY WORK

Carry out all masonry work with people competent and experienced in this type of work, under the supervision of a suitably qualified tradesperson as required in NZS 4210. All work to be installed or supervised by a Registered Mason or licensed building practitioner (LBP): Licensed for Bricklaying and Blocklaying : Structural Masonry. RBW must be supervised by an LBP. Concrete workers to be experienced, competent and familiar with the materials and the techniques specified.

1.5 QUALIFICATIONS - IN SITU CONCRETE WORK

Carry out all in-situ concrete work with people competent and experienced in this type of work. All work to be installed or supervised by a licensed building practitioner (LBP): Licensed for Foundations (Foundations 1). RBW must be supervised by an LBP. Concrete workers to be experienced, competent and familiar in the fabrication and erection of formwork and with the materials and the techniques specified.

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1.6 CONSTRUCTION CONTROL MASONRY

Supervise masonry construction to NZS 4230, table 3.1, Observation Type C, admissible use and nominal strengths. Keep records of materials to NZS 4210, 2.4.2.

The mason is to certify in writing to the owner that the masonry observation and work has been carried out in accordance with the relevant NZ Standards. Provide a Producer Statement - Construction (PS3).

1.7 STEEL REINFORCING COMPLIANCE

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

1.8 QUALITY RECORDS

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

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

2 PRODUCTS

General

2.1 REINFORCEMENT

To AS/NZS 4671, 300E deformed mild steel except for ties in plain round mild steel and as detailed. Refer to Concrete section for reinforcing for slabs.

2.2 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.3 WATER

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

Concrete

2.4 NORMAL CONCRETE

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

2.5 SPACERS AND CHAIRS

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

Concrete masonry

2.6 MASONRY UNITS

To AS/NZS 4455.1.

2.7 MORTAR

Sand to NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand. Mortar to NZS 4210, section 2.2, **Mortar**. Compressive strength of not less than 12.5 MPa.

2.8 GROUT

To NZS 4210, section 2.3, **Grout**.

3 EXECUTION

General

3.1 GENERAL PARAMETERS

Foundation walls to NZS 3604, 6.11**, Foundation walls....** and masonry foundation walls under slabs to NZS 3604, 7.5, **Concrete slab-on-ground floors .....** and NZBC B1/AS1, 2.3 **Timber**.

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3.2 STORAGE

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

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

3.3 STARTER POSITIONS

Before commencing , check the location of starter reinforcement. Do not correct misplacement by cranking bars. Where misplacement exceeds the location tolerance, obtain written direction before proceeding.

3.4 REINFORCEMENT

Reinforce walls to NZS 3604, **6.11 Foundation walls....**

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

3.5 REINFORCEMENT LAPS

To NZS 3604, 6.11.7, **Foundation wall reinforcement**. Horizontal reinforcing bars lapped 500mm minimum.

To NZS 4229, 6.6.3, 40 diameter laps for deformed bars.
Tie all lapping bars to each other.

3.6 COVER

Cover for reinforcement to NZS 3604, 4.5.1 for minimum concrete cover and NZS 3604, 4.5.3 for concrete masonry. For general purpose minimum 50mm cover, or varied to suit exposure conditions. Minimum cover 75mm for walls against earth.

3.7 OPENINGS

Reinforcing around openings to NZS 3604, 6.11.7.3, for opening over 300mm wide and for concrete or masonry lintels up to 600mm wide.

Form 600mm wide subfloor access point as shown on the drawings.

3.8 BRACING

Provide adequate temporary lateral bracing to ensure stability until the final supporting construction is in place and has cured sufficiently.

3.9 SUB-FLOOR VENTILATION

Build in precast sub-floor ventilators to NZS 3604, 6.14, **Prevention of dampness** Locate 750mm from corners and at a maximum of 1.8m centres, or as shown on the drawings. Refer to SELECTIONS.

3.10 BUILD IN

Build in plugs, bolts, ties, metal flashings, dowels, fastenings and fixings as required by all trades and as shown on the drawings.

3.11 PROPRIETARY FIXINGS FOR WALL PLATES AND BOTTOM PLATES

Allow for proprietary plate fixings/anchors and install to manufacturer's instructions, as stated in SELECTIONS or as shown on the drawings.

Locate fixings to NZS 3604, 7.5.12.2, within 150mm of the ends of the plate, and maximum 900mm centres or 600mm centres for slab edges of masonry header blocks. Ensure subfloor braces have at least 2 x fixings per length of plate. All braced elements to manufacturer's specific requirements. Drilled in expanding bolts are generally not acceptable.

Concrete

3.12 CONCRETE CONSTRUCTION GENERALLY

To NZS 3109 and NZS 3604, **6.11 Foundation walls (concrete and concrete masonry)**.
Minimum wall widths, 130mm single storey and 150mm 1 to 2 storeys. Wall widths are also subject to minimum reinforcing cover requirements, refer COVER clause.

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3.13 FORMWORK

Use formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

3.14 SURFACE FINISHES

To NZS 3114, clause 105, Specification of finishes, refer to SELECTIONS.

3.15 PUMPING CONCRETE

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

3.16 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.17 SURFACE DEFECTS

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

3.18 STRIKE FORMWORK

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

12 hours:	Sides of beams, walls and columns
6 days:	Under beams/lintels (under veneer walls leave props under big spans)

Concrete masonry

3.19 MASONRY CONSTRUCTION GENERALLY

To NZS 4210 and NZS 3604, **6.11 Foundation walls (concrete and concrete masonry)**. Minimum wall widths, 140mm single storey and 190mm for 1 to 2 storeys and masonry veneer. Wall widths are also subject to minimum reinforcing cover requirements, refer COVER.

3.20 DURABILITY

Ensure that, mortar, built in components and reinforcement cover are to NZS 4210, table 2.E1 Masonry durability requirements, for the location and the Exposure Zone in the general section 1220 PROJECT. To use the table, exposure zones in NZS 3604 comparable with NZS 3101.1 (in brackets) are;

Zone D (B2), Zone C (B1), Zone B (A2), Closed Interior (A1), Walls against earth (B2), Geothermal hotspots (U), and NZBC E2/AS1 Zone E (C).

3.21 MOISTURE CONTENT

Store masonry units clear of the ground, under cover and well ventilated until placed in the work. Ensure masonry units are air dry prior to laying.

3.22 CHECK BASE CONCRETE

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

3.23 TOLERANCES

Construct within the tolerances set out in NZS 4210, clause 2.6.5, Tolerances, and clause 2.7.1, General. Lay masonry units with bedding of consistent thickness throughout.

3.24 PROTECTION

Protect fair-faced masonry walls, keeping them clear of mortar droppings, grout splashes, or stains of any kind.

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3.25 LAY MASONRY UNITS

Ensure consistent, fully filled and tooled joints. Where walls are reinforced, prevent mortar droppings from entering the cells to be grouted. Provide clean out holes at base of wall, unless "low lift" (NZS 4210) grouting is used. Ensure reinforcement is accurately placed and tied. Lay in regular stretcher bond with all necessary special units. Cut masonry, if necessary, true and square without chipping.

Mortar joints not exceeding 10mm thick, or less than 8mm when the units are bedded in. Joints tooled concave, unless detailed otherwise.

3.26 VERTICAL CONTROL JOINTS

Locate at major changes of wall height or thickness, at openings, and at not more than the centres scheduled below to NZS 4210 2.10.1.2(c), or, as shown on the drawings. Where reinforcement passes through a control joint, provide for breaking bond using methods detailed on NZS 4210, figure 2, Control joint, unless specifically detailed otherwise.

Spacing of control joints schedule

HEIGHT OF WALL	HORIZONTAL SPACING OF JOINTS
up to 800mm	24m maximum
up to 1.2m	12m maximum
up to 2m	8m maximum

3.27 PRE-GROUTING INSPECTION

Inspect walls prior to grouting. Ensure cells are clean and reinforcement is correctly placed. Where "high lift" (to NZS 4210) grouting is used, seal the clean out holes and brace to prevent blow outs.

3.28 GROUT CELLS

Grout all masonry unit cells.

Use procedures set out in NZS 4210. Methods acceptable on this project are:

- high lift grouting with expansive admixture
- high lift grouting with reduced compaction, without expansive admixture
- low lift grouting.

Completion

3.29 PROGRESSIVE CLEANING

Clean off mortar splashes and concrete/grout spills as they occur, making good any damage at the same time.

3.30 FINAL CLEANING

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

3.31 REMOVE

Remove from the site materials not used.



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3101 CONCRETE WORK - BASIC

1 GENERAL

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

1.1 RELATED WORK

Refer to 2362 FOUNDATION WALLS for construction of new foundation walls.

Refer to 2310 FOUNDATION for construction of new foundation slab.

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

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

ACRS web site - www.steelcertification.com

Documents

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E2/AS3	External moisture provisions for concrete and concrete masonry buildings
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

Requirements

1.4 QUALIFICATIONS

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

1.5 STEEL REINFORCING COMPLIANCE

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



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2 PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

2.2 SITE CONCRETE

Concrete 10 MPa with minimum water for workability, all materials and batching to NZS 3104, table 3.1, Prescribed mixes (P).

2.3 REINFORCEMENT

Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671, and 500E mesh to AS/NZS 4671.

2.4 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground mesh to be welded reinforcing mesh to AS/NZS 4671, Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction).

2.5 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.6 SPACERS AND CHAIRS

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

2.7 CELLULAR POLYSTYRENE INSULATION

Proprietary expanded polystyrene (EPS) foam board to AS 1366.3.

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3 EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 INSTALL CELLULAR POLYSTYRENE INSULATION

Install EPS insulation system to manufacturer's requirements.

3.4 CUT AND BEND REINFORCEMENT

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

3.5 ADJUSTMENTS

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

3.6 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.7 SECURE REINFORCEMENT

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

3.8 LAPPED SPLICES

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

3.9 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

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

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

Do not count bar extensions beyond the outermost cross wire.

3.10 REINFORCEMENT COVER TO NZS 3101.1

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

3.11 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

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

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

3.12 EQUIPOTENTIAL BONDING REINFORCING

Co-ordinate with electrician to provide for equipotential bonding of reinforcing as required by AS/NZS 3000, 5.6 Equipotential Bonding, before concrete placement.

3.13 CASTING IN

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

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

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

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

3.14 CONSTRUCTION JOINTS

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

3.15 PRE-PLACEMENT INSPECTION

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

3.16 SURFACE FINISHES

To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.17 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.18 PUMPING CONCRETE

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

3.19 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.20 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3.

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Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 2.3 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 24m centres to NZBC B1/AS1, paragraph 2.3.7.6 **NZS 3604 New clause**.

3.21 FLOOR SLABS TO NZS 4229

Generally for slabs on ground to NZS 4229 as modified by NZBC B1/AS1 and NZBC E2/AS3.

Construct to NZS 4229, 6, **Footings** and NZS 4229, 7, **Foundation walls and concrete slab-on-ground** as modified by NZBC B1/AS1, 2.1 **Masonry**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 18m centres to NZS 4229, 7.8.5.3 **Free joints**.

3.22 SAW CUTS TO NZS 3604 OR NZS 4229

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 ºC, and 48 hours for average ambient temperatures below 20ºC).

3.23 SAW CUTS

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

3.24 SPACING OF SAW CUTS

Spacing of sawcuts

Floor situation	Maximum spacing of sawcuts both ways
Industrial floor	5m
Architectural, exposed floor, thin finishes, rigid finishes	4m
Carpet on underlay flooring	6m

3.25 SURFACE DEFECTS

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

3.26 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.27 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.28 CLEAN OUT

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

3.29 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

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3320 CONCRETE MASONRY

1 GENERAL

This section relates to the supply and installation of hollow concrete masonry to NZS 4229, as modified by NZBC E2/AS3, including;

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

1.1 RELATED WORK

Refer to 2361 STRIP FOOTINGS for simple strip footings.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

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

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E2/AS3	External moisture provisions for concrete and concrete masonry buildings
AS/NZS 2699	Built-in components for masonry
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3103	Sands for mortars and plasters
NZS 3109	Concrete construction
NZS 3121	Water and aggregate for concrete
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4230	Design of reinforced concrete masonry structures
AS/NZS 4455.1	Masonry units, pavers, flags, and segmental retaining wall units - Masonry units
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls

Requirements

1.4 QUALIFICATIONS – INDUSTRY QUALIFICATION REQUIREMENTS

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

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1.5 CONSTRUCTION CONTROL

Supervise masonry construction to NZS 4230: table 3.1, Observation type B, admissible use and nominal strengths. Keep records of materials to NZS 4210: 2.4.2.

1.6 CONSTRUCTION OBSERVATION BY ENGINEER

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

Obtain from the engineer Producer Statements required relating to the masonry construction. Where required as a condition of the building consent, advise the engineer when inspections are required.

1.7 STEEL REINFORCING COMPLIANCE

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

1.8 TESTS

Carry out all required tests in accordance with NZS 4210: appendix 2A, Compressive strength tests for mortar and grout.

1.9 QUALITY RECORDS

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

Do not place grout until all blockwork and reinforcing have been inspected and passed by the Building Consent Authority.
The registered mason is to certify in writing that the masonry observation and work has been carried out in accordance with the relevant NZ Standards. Provide a Producer Statement - Construction (PS3).

Performance

1.10 DURABILITY

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

EXPOSURE	**DURABILITY REQUIREMENT**		
NZS 3604 ZONES figure 4.2	MORTAR (Note 1)	BUILT IN COMPONENTS (Note 2)	MINIMUM COVER REINFORCEMENT (Note 3)
Zone D	M4	R4	30 (60)mm
Zone C	M4	R3	20 (50)mm
Zone B	M3	R3	15 (45)mm
Closed interiors	M2	R1	5 (35)mm
Walls against earth	M4	R4	30 (60)mm
Geothermal hotspots	M4	R5	Specific engineering design
Zone E (NZBC E2/AS1)	M4	R4	30 (60)mm

Notes

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

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2 PRODUCTS

2.1 MASONRY UNITS

To AS/NZS 4455.1.

2.2 REINFORCEMENT

Grade 500E to AS/NZS 4671 deformed mild steel except for ties in plain round mild steel and as detailed.
Refer to the Concrete section for reinforcing and mesh for slabs.

2.3 MORTAR

Sand to NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand. Mortar to NZS 4210: section 2.2, Mortar. Compressive strength minimum 12.5 MPa at 28 days

2.4 GROUT

To NZS 4210: section 2.3, Grout, with minimum compressive strength of 17.5 MPa.

2.5 WATER

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

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3 EXECUTION

3.1 MASONRY CONSTRUCTION GENERALLY

To NZS 4210, NZS 4229 as modified by NZBC E2/AS3 (CCANZ CP 01).

3.2 STORAGE

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

3.3 MOISTURE CONTENT

Ensure masonry units are air dry prior to laying.

3.4 CHECK BASE CONCRETE

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

3.5 STARTER POSITIONS

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

3.6 REINFORCEMENT

Reinforcement to NZS 4229 and NZS 4210: 2.6, **Reinforcing details**.
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.7 REINFORCEMENT LAPS

Tie all lapping bars to each other.

Minimum wall reinforcing laps schedule

BAR TYPE	LAP LENGTH
Deformed	40 diameters
Plain round (with hooks)	80 diameters

For shrinkage control joint reinforcing refer to clause VERTICAL CONTROL JOINTS.

3.8 COVER

Cover to NZS 4210, Table 2.E1 - **Masonry durability requirements**, refer to DURABILITY clause in SELECTIONS.

3.9 EQUIPOTENTIAL BONDING REINFORCING

Co-ordinate with electrician to provide for equipotential bonding of reinforcing as required by AS/NZS 3000, 5.6 Equipotential Bonding, before concrete placement.

3.10 TOLERANCES

Construct within the tolerances set out in NZS 4210: clause 2.6.5, **Tolerances**, and clause 2.7.1, **General**. Lay masonry units with bedding of consistent thickness throughout.
Reinforcement to NZS 3109: 3.9 **Tolerances for reinforcement**.

3.11 PROTECTION

Protect fair-faced masonry walls, keeping them clear of mortar droppings, grout splashes, or stains of any kind.

3.12 LAY MASONRY UNITS

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Ensure consistent, fully filled and tooled joints. Where walls are reinforced, prevent mortar droppings from entering the cells to be grouted. Provide clean out holes at base of wall, unless "low lift" (NZS 4210) grouting is used. Ensure reinforcement is accurately placed and tied. Lay in regular stretcher bond with all necessary special units and sill units. Cut masonry, if necessary, true and square without chipping.

3.13 MASONRY UNITS JOINTS

Not exceeding 10mm thick, or less than 8mm when the units are bedded in. Joints tooled concave, unless detailed otherwise.

3.14 VERTICAL CONTROL JOINTS

To NZS 4229 12.1 **Shrinkage control joints**.
Locate at major changes of wall height or thickness, at openings, at ground slab control joints, and at not more than 6m centres, or, as shown on the drawings. Where reinforcement passes through a control joint, provide for breaking bond using methods detailed on NZS 4229 fig. 12.2, **Control joint detail...**, unless specifically detailed otherwise.

3.15 BRACING

Provide sufficient temporary lateral bracing to ensure stability until the final supporting construction is in place.

3.16 PRE-GROUTING INSPECTION

Inspect walls prior to grouting. Ensure cells are clean and reinforcement is correctly placed. Where "high lift" (to NZS 4210) grouting is used, seal the clean out holes and brace to prevent blow outs.

3.17 GROUT CELLS

Grout all masonry unit cells.

3.18 GROUTING PROCEDURE

Use procedures set out in NZS 4210. Methods acceptable on this project are:

- high lift grouting with expansive admixture
- high lift grouting without expansive admixtures
- low lift grouting.

3.19 CONSTRUCTION JOINTS

Form and treat construction joints between grout pours and between masonry walls and hardened concrete work to ensure bonding occurs. Comply with NZS 4210: 2.16, **Horizontal construction joints**.

3.20 MORTAR-IN COMPONENTS

Mortar-in components such as sills, copings, lintels, and steps, as work proceeds.

3.21 BUILD-IN

Build-in plugs, bolts, ties, metal flashings, dowels, fastenings and fixings as required by all trades and as shown on the drawings.

3.22 PROGRESSIVE CLEANING

Clean off mortar splashes and grout spills as they occur, making good any damage at the same time.

3.23 FINAL CLEANING

Clean down masonry work and remove waste material from adjoining surfaces and floors at completion.

3.24 REMOVE

Remove from the site materials not used.

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3410 STRUCTURAL STEEL

1 GENERAL

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

Refer to SELECTIONS for project Construction Category.

1.1 RELATED WORK

Refer to 3415 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL for additional AESS requirements.

Refer to painting section(s) for standard paint finishes.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

1.3 DOCUMENTS

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

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

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AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 3679.2	Structural steel - Welded I sections
AS/NZS 3750.9	Paints for steel structures - Organic zinc-rich primer
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 13918	Welding - studs and ceramic ferules for arc stud welding
GANZ	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users

Requirements

1.4 QUALIFICATIONS

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

1.5 TOLERANCES

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

1.6 VERIFY DETAILS AND DIMENSIONS

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

1.7 TESTS

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

- Welds: Non-destructive examinations (NDE)

1.8 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

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2 PRODUCTS

2.1 STRUCTURAL STEEL

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

Steel members and sections steel grade table

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

2.2 WELDING CONSUMABLES

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

2.3 FLUX

Welding flux to be dry and from sealed containers.

2.4 BOLTS, NUTS AND WASHERS

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

Bolt Categories and tensioning

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

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

2.5 GROUT

To AS/NZS 5131, 5.8.

3 EXECUTION

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Preparation, assembly and Fabrication

3.1 GENERALLY

To AS/NZS 5131, Section 6.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.3 ROUTINE MATTERS

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

3.4 SURFACE FINISH

Grind off all burrs and sharp arrises.

3.5 CUTTING

To AS/NZS 5131, Section 6.5.

3.6 HOLING

To AS/NZS 5131, Section 6.7

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

Welding

3.7 WELDING GENERALLY

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

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

3.8 NON-DESTRUCTIVE WELD EXAMINATION

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

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

Mechanical fastening

3.9 MECHANICAL FASTENING GENERALLY

To AS/NZS 5131.

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

3.10 TENSIONING BOLTS

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

3.11 THREADS EXCLUDED FROM SHEAR PLANE

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

Erection of structural steel

3.12 ERECTION GENERALLY

To AS/NZS 5131, Section 11.



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

3.13 BOLTS AND ANCHORAGES

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

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

3.14 TEMPORARY WORK

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

3.15 SITE WORK

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

3.16 GROUTING SUPPORTS

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

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

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

3.17 DRIFTING

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

Finishing - preparation

3.18 ENCASED STEELWORK

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

3.19 POWER TOOL CLEANING

To AS/NZS 5131, Section 9.

Remove oil and grease by the use of solvents. Scrape, wire brush and power tool clean to a minimum Class 2 finish to AS 1627.9. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.20 ABRASIVE BLASTING

To AS/NZS 5131, Section 9.

Remove oil and grease by the use of solvents. Abrasive blast clean to a Class 2.5 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

Finishing - paint and protective coatings

3.21 PAINTING

Refer to the appropriate separate painting section(s) for painting requirements.

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3.22 UNPAINTED SURFACES

Do not paint:

- faying face of high strength friction grip bolted joints
- areas for site welding, keeping 75mm clear all round
- surfaces being embedded in concrete.

Where steel is only partly encased then extend priming 50mm minimum into the concrete encasement area.

3.23 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.24 COMPLETION MATTERS

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

4 SELECTIONS

4.1 CONSTRUCTION CATEGORY

Construction category (to AS/NZS 5131)	Location
CC2	All steelwork unless noted otherwise (refer to engineer's design and spec)

Finishing - preparation

4.2 STEEL PREPARATION

Item:	Steel beams in roof spaces, steel posts within wall framing. All steel work not exposed.
Preparation:	paint primer finish

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3415 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

1 GENERAL

This section relates to the fabrication and erection to AS/NZS 5131 of Architecturally Exposed Structural Steelwork (AESS), with higher than normal appearance requirements than Standard Structural Steel (SSS).

Refer to PROJECT AESS CATEGORY SCHEDULE clause for project AESS Category(s).

This section is to be read in conjunction with the following SSS section:
3410 STRUCTURAL STEEL

1.1 RELATED WORK

Refer to 3410 STRUCTURAL STEEL for standard structural steel construction

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AESS:	Architecturally Exposed Structural Steelwork
SSS	Standard Structural Steel

Documents

1.3 DOCUMENTS

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

NZS 3404.1	Steel Structures Standard
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 5131	Structural steelwork - Fabrication and erection

1.4 GENERAL

Architecturally Exposed Structural Steel (AESS) requirements are to AS/NZS 5131 Section 10, and are additional to Standard Structural Steel (SSS) requirements. This AESS section does not specify all structural requirements for a project, it modifies those in the SSS sections. Areas to be treated as AESS and the AESS Category (1,2,3, or 4) are designated on the Project Drawings or in the specification. Steel not designated AESS on the drawings or in the specification are to be treated as SSS.

1.5 PROJECT AESS CATEGORY SCHEDULE

AESS Category(s) to AS/NZS 5131, 10.2.

AESS Category	Location/elements
AESS 4	steel catwalk V-brace structure and spiral staircase, sheet 101, 202, 303, 304

1.6 MEETING - PRE-SHOP DRAWING

If required attend meeting to discuss expectations of form, fit and finish of the AESS steel.

Attendees to be:

- Contract Administrator (Convener)
- Fabricator (including shop drawing provider if different)
- Erector
- Contractor
- Architect/Designer
- Engineer

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Submissions

1.7 SHOP DRAWINGS

Read in conjunction with the SSS section and integrate the requirements of this clause into the main shop drawings.

Generally to AS/NZS 5131, 4.4.
Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of the main final shop drawings.

Provide additional shop drawing information to show, but not be limited to:

- Identify all AESS members and items to a Category, either AESS 1, 2, 3, 4.
- Identify tack welds, temporary braces, fixtures used in fabrication.

Submit shop drawings as per requirements of SSS section.

Complete shop drawing review before commencing fabrication.

1.8 ALTERNATIVE CAST CONNECTIONS

Alternative cast steel connections to replace complex AESS multi member connections may be proposed by the fabricator at the shop drawing stage (or earlier), if they will be more economical. Add to shop drawings if approved.

1.9 ALTERNATIVE BOLTED CONNECTIONS

Alternative discreet bolted connections to replace complex AESS field welded connections or obtrusive spliced bolted connections may be proposed by the fabricator at the shop drawing stage (or earlier), if they will be more desirable and/or economical. Add to shop drawings if approved.

1.10 ALTERNATIVE ADJUSTABLE CONNECTIONS

To overcome the difference at connections between AESS tighter tolerances and normal SSS (or other structure) tolerances, adjustable connections may be required. Show proposed or alternative proposed adjustable connections on shop drawings. If issues arise during erection, erector to propose alternative adjustable connections for approval.

Hold Points and Notification Points

Refer to section 1232 INTERPRETATION & DEFINITIONS for definition of terms.

1.11 NOTIFICATION POINTS

Notify of Notification Point AESS work/item, continue with the work/item and subsequent work unless advised otherwise.

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

Give notice so that inspection may be made of the following AESS items;

Location	Notification Point	Requirement
Off Site	commencement of AESS shop fabrication	before beginning fabrication
Off Site	completion of AESS fabrication	before surface preparation
Off Site	AESS surface preparation	before shop surface finishes
Off Site	completion of AESS surface finishes	before delivery to site
On Site	AESS steelwork on site before erection	before installation
On Site	AESS steelwork and column bases erected on site	before grouting, encasing, site finishes or cladding
On Site	AESS items after any grouting, encasement, fire protection or site finishes are completed	before practical completion

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2 PRODUCTS

2.1 AESS MILL SURFACE APPEARANCE

To AS/NZS 5131, Section 10.

- For AESS 1, 2 and 3, the quality surface as delivered by the mills should be acceptable.
- For AESS 4, the steel surface imperfections should be filled and sanded.

2.2 AESS TOLERANCES FOR ROLLED SHAPES

To AS/NZS 5131, Section 10, Tolerance Class 1.
Tolerances for depth, width, and out of square, camber and sweep of rolled shapes to AS/NZS 3678 or AS/NZS 3679.1, and AS/NZS 5131, as appropriate for depth, flange width, flange and web thickness, out of square and web off centre. Built up section, tension or compression member to NZS 3404.1 and AS/NZS 5131. The following exceptions apply:

- For AESS 3 and 4, the matching of abutting cross-sections is required
- For AESS 2, 3 and 4, the as-fabricated straightness tolerance of a member is one-half of the standard camber and sweep tolerance in AS/NZS 5131, Appendix F.

2.3 SURFACE PREPARATION AND TREATMENT - PAINT & PROTECTIVE COATING

AESS items to be painted or have protective coatings, Treatment Grade P3 and surface preparation Sa2.5 to AS/NZS 5131, 9.8.4, co-ordinate with applicator to ensure best outcome, refer to appropriate painting or protective coating section.

3 EXECUTION

3.1 HANDLING AESS STEEL

Take special care in handling the steel to avoid, marking or distorting the steel members, and damaging any shop finishing, paint or coating.
All slings and tie-downs to be nylon type or chains with softeners or wire rope with softeners.

3.2 AESS GENERALLY

To AS/NZS 5131, Section 10.

3.3 TEMPORARY ITEMS

With AESS work any temporary braces or fixtures required during fabrication, during shipment, or to facilitate erection, special care must be taken avoiding and/or repairing any blemishes or unsightly surfaces resulting from use or removal of those elements.
Tack welds to be ground smooth.

AESS preparation, assembly and fabrication

3.4 AESS FABRICATION TOLERANCES

To AS/NZS 5131, Section 10, Table 10.2, Tolerance Class 1:

- For AESS 1 to AS/NZS 5131, Appendix F
- For AESS 2, 3 and 4, to one-half of the tolerances in AS/NZS 5131, Appendix F.

3.5 AESS FABRICATION

Additional requirements to AS/NZS 5131, 10.4.

Grind smooth sharp, marred, or roughened corners and edges.
Deburr and ground smooth rough surfaces.

3.6 JOINTS

For Categories AESS 3 and 4, copes, mitres and butt cuts exposed to view to have uniform gaps if open jointed, or to have uniform contact if closed jointed.

3.7 WELDS

To AS/NZS 5131, Table 10.2 and the welding requirements in AS/NZS 5131, 10.4, including:

- For corrosive environments, all joints to be seal welded.
- For AESS 1, 2 and 3, smooth uniform welds. For Category AESS 4, welds to be contoured and blended.
- For AESS 1, 2, 3 and 4, weld spatter to be avoided/removed where exposed to view.
- For AESS 1 and 2, weld projection up to 2 mm is acceptable for butt and plug welded joints. For Categories AESS 3 and 4, welds will be ground smooth/filled.

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3.8 WELD SHOW-THROUGH

To AS/NZS 5131, Table 10.2 and AS/NZS 5131, 10.4, including:

- For AESS 1, 2 and 3, the members or components are acceptable as produced.
- For AESS 4, the fabricator to minimize weld show-through.

3.9 HOLLOW STRUCTURAL SECTIONS (RHS AND CHS) SEAMS

To AS/NZS 5131, Section 10.4 (q).

For AESS 1 and 2, seams to be acceptable as produced.
For AESS 3, seams to be oriented away from view or as indicated on the drawings.
For AESS 4, seams to be treated so they are not apparent.

Erection of AESS structural steel

3.10 AESS ERECTION TOLERANCES

To AS/NZS 5131 Section 12 and Appendix F:

- For AESS 1 and 2 to Appendix F, Tolerance Class 1
- For AESS 3 and 4, to Appendix F, Tolerance Class 1

3.11 AESS ERECTION

Additional requirements to AS/NZS 5131, 10.5.

3.12 TACK WELDS & HOLES

Tack welds to be ground smooth and holes to be filled with weld metal or body filler and smoothed by grinding or filling to the original applicable fabrication standards.

3.13 BACKING BARS

Remove backing bars and grind smooth, repair any coatings.

3.14 BOLT HEADS

All bolt heads to be on the same side of the connection as detailed, and all connections to be consistent.

Repairs

3.15 GENERAL REPAIRS

Repairs to AESS elements to be not apparent when completed

Completion

3.16 SPECIAL PROTECTION OF AESS WORK

Provide the following temporary protection of the finished AESS work:

Ensure paint work is protected during delivery.

Refer to the general section 1250 TEMPORARY WORKS & SERVICES for the general care and protection requirements.

3.17 VERIFY TOLERANCES OF AESS WORK

After completing erection, verify conformance of AESS work with AS/NZS 5131 Section 12 and Appendix F as modified by AESS requirements.

4 SELECTIONS

4.1 STEELWORK SELECTIONS

For steelwork selections and other standard requirements refer to the Standard Structural Steel (SSS) section listed at the beginning of this section.



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3820 CARPENTRY

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as partitioning. It includes prefabricated timber and engineered wood.

1.1 RELATED WORK

Refer to 2310 FOUNDATIONS for piles and subfloor framing.

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.
Refer to 2362 FOUNDATION WALLS for foundations walls to NZS 3604.
Refer to 3101 CONCRETE WORK - BASIC for floor slabs.
Refer to 4230 WALL CLADDING and windows and doors section/s for exterior trim.
Refer to 5120 LININGS and windows and doors section/s for interior trim.

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

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
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 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

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

1.4 QUALIFICATIONS

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

1.5 DIMENSIONS

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

2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

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

2.2 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.

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2.3 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 or H3.2 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.

2.4 EXTERIOR CAVITY WALL BATTENS - PROPRIETARY - NON-STRUCTURAL

Extruded polypropylene battens, size approximately 45mm wide x 18mm thickness. Temporary fix battens before being fixed into the framing with the cladding fixings. To the scope limitations of NZBC E2/AS1, and NZS 3604 Building Wind Zones up to, and including "Extra High".

Components

2.5 NAILS

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

2.6 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.

2.7 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.

2.8 NAIL PLATES

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6 - 10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

2.9 CONNECTORS

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

2.10 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

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

2.11 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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3 EXECUTION

3.1 EXECUTION GENERALLY

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

3.2 SEPARATION

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

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

3.3 ATTENDANCE

Provide and fix blocks, nogs, openings and other items as required by other trades.

3.4 MOISTURE CONTENT

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

Framing at erection:	24% maximum
Framing at enclosure:	20% maximum
Framing at lining:	16% maximum

3.5 SET-OUT

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

3.6 FRAMING SUB-FLOOR

Frame up off foundation walls and piles, all fabricated, fastened and braced to NZS 3604, section 6.10, **Framed subfloor walls**.

3.7 FRAMING FLOORS

Framed and fastened to NZS 3604, section 7, **Floors**.

3.8 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8, **Walls**.

3.9 FRAMING ROOFS

Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.

3.10 FRAMING CEILINGS

Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

3.11 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.12 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to NZS 3604. Fit and fix related flashings. Make allowance for cladding control joints where required. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.13 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.14 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

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4 SELECTIONS

4.1 SUB-FLOOR FRAMING - RADIATA PINE

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

4.4 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1

4.5 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.6 INTERIOR FRAMING - RADIATA PINE

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

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3897 REPLACEMENT & TREATMENT OF DECAYED TIMBER

1 GENERAL

This section relates to identification and testing of decayed timber and for its replacement and/or treatment to NZBC B1 and NZBC B2. It includes;

- Decay due to rot from fungal and mould growth
- Decay due to insect attack

1.1 RELATED WORK

Refer to the appropriate timber framing section for additional timber work.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BAE	Boric acid equivalent

Documents

1.3 DOCUMENTS

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

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

Health and Safety at Work Act 2015

Note;

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

Requirements

1.4 QUALIFICATIONS

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

1.5 COMPLIANCE INSPECTIONS - BCA

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

1.6 COMPLIANCE INSPECTIONS - SEPARATE CONSULTANT

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

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1.7 PHOTOGRAPHIC RECORD

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

1.8 PROVIDE TEMPORARY PROTECTION

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

2 PRODUCTS

Materials

2.1 BRUSH ON TIMBER TREATMENT

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

3 EXECUTION

Removing fungi and mould affected timber

3.1 TESTING

Take samples as required for testing. Samples must be of the required size and labelled to identify the source.

3.2 HEALTH AND SAFETY WHEN DEALING WITH MOULD

To Health and Safety at Work Act 2015.

Where moulds and fungi have to be removed as part of the repair, comply with relevant Health and Safety requirements. Ensure workers removing moulds and fungi in the building wear suitable protective equipment including disposable overalls, appropriate breathing masks and gloves. Refer to MBIE Workplace Health Bulletin No. 17 and WorkSafe for further information.

Disturb moulds and fungi as little as necessary.

3.3 HEAVY MOULD GROWTH

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

3.4 PROVIDE TEMPORARY COVERS

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

3.5 AVOID CONTAMINATION OF OTHER AREAS

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

3.6 REMOVING DECAYED TIMBER

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

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

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

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

Removed timber and debris, to be disposed of offsite.

3.7 DIFFICULT TO REACH TIMBER

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

Removing borer affected timber

3.8 REMOVING BORER INFESTED TIMBER

Remove all timber that has significant disintegration and/or soft areas. Remove structural, framing and waterproofing timber that has significant intense areas of borer holes. Cladding, linings and trim can be temporarily removed and inspected, if unaffected or only slightly affected but sound, then treated and reused.

Native timber framing which are mostly unaffected heart wood, but with small pockets of infected sap wood, must be assessed for structural adequacy. If deemed structurally adequate, treat and leave in place.

Isolated single floor boards without disintegration or soft areas, but sound with intense areas of borer holes (above or below) can be left in place, treated and holes filled. Reinforce from underneath with minimum 12mm H3 plywood panels, screwed and glued to at least two non-infected boards on either side.

Err on the side of caution when replacing untreated timber framing.

3.9 REMOVAL SEQUENCE

Generally it is preferable to remove, treat then replace.

However, in some cases, as long as there is no fungi or mould present, it may be possible to treat insect infected timber framing, install replacement framing and then remove badly affected timber. Treat cuts afterwards.

3.10 REMOVING DEBRIS FROM SITE

Removed timber and debris, to be disposed of offsite.

Treating timber

3.11 REMOVE EXISTING COATINGS

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

3.12 TREATING SOUND TIMBER

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

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

3.13 BRUSH ON TREATMENT

Apply brush on timber preservative treatment to areas affected.

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3.14 INJECTING TREATMENT

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

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

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

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

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

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

Replacing timber

3.15 REPLACING TIMBER

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

3.16 WALL FRAMING

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

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

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

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

3.17 FLOOR FRAMING

Where decay has affected floor joists, it may be possible to insert a new beam within the floor space to support the remaining length of joist and the replacement joists, usually by using joist hangers (Refer MBIE Dealing With Timber In Leaky Buildings, Figures 6a and 6b). The beam will need to be supported and the design must ensure loads are transferred to the foundations.

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3.18 CLOSING IN

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

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4131 BITUTHEN AND PREPRUFE MEMBRANE TANKING SYSTEM

1 GENERAL

1.1 GENERAL

This section relates to the application of;
- Preprufe® 300R Plus Tanking membrane as a single layer under the slab
- Preprufe® 300RPlus Tanking membrane as a single layer on walls are constructed of shotcrete (if blindside tanking) or
- Preprufe® 160R Plus Tanking membrane as a single layer on walls (if blindside tanking) or
- Bituthene® 3000 Self-Adhesive Tanking membrane as a single layer on walls
- All components and accessories to complete installation

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

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 SUPPLIER'S DOCUMENTS

Supplier's documents from NURALITE Waterproofing Limited relating to work in this section are:
- Nuralite Bituthene®/ Preprufe® Detail Drawings
- Designers site specific Bituthene®/ Preprufe® Detail Drawings
- Nuralite Bituthene®/ Preprufe® Install Method Statement (including checklists)
- Nuralite Bituthene®/ Preprufe® Products - Technical Data Sheets
- BRANZ Appraisal 1158 - Nuralite Damp Proof and Tanking Membranes

Copies of the above literature are available from Nuralite Waterproofing Ltd

Web: www.nuralite.co.nz

Telephone: 09 5792046 Auckland
0800 Nuralite (0800 687 254)

Facsimile: 0-9-579 5136 Auckland

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years For Bituthene® 3000 and Preprufe® tanking
- Provide this warranty on the NURALITE Waterproofing Materials Warranty form.
- Commence the warranty from the date of completed installation.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years For Bituthene® 3000 and Preprufe® tanking system installation
- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.6 QUALIFICATIONS

Tanking to be carried out by competent workers licensed by NURALITE Waterproofing Limited and experienced with NURALITE materials system and specialist techniques. Provide on request evidence of experience prior to commencing work.

Contact Nuralite at www.nuralite.co.nz/Applicator_List for a listing of approved applicators.

1.7 NO SUBSTITUTIONS

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

1.8 PRE-INSTALLATION

Convene a meeting between the applicator, contractor, all associated consultants and Nuralite Waterproofing Ltd to ensure all parties know what is required for effective performance of the system, prior to tanking installation.

1.9 SPECIFIC DETAILS

All detailing to be in accordance with Nuralite Waterproofing Ltd standard details. Where required, specific details must be requested and provided prior to proceeding with installation.



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Compliance information
1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE
Provide the following compliance documentation: -
- Installer's approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importer's or distributor'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.

Performance
1.11 PRESSURE RATING
NURALITE to review details and specification of the complete membrane system if there is expected to be hydrostatic pressure on the installed membrane.

2 PRODUCTS

2.1 MATERIALS - BITUTHENE®

Materials - Bituthene®

2.1 BITUTHENE 3000 SELF ADHESIVE TANKING MEMBRANE
Self-adhesive membrane comprising of a modified bitumen sheet on a cross laminated polyethylene backing. 1.5mm thick x 1m wide x 20m long rolls.
2.2 DRY CONCRETE SUBSTRATE PRIMER
BITUTHENE® SOLVENT PRIMER is a bitumen-based primer in solvent which is specifically formulated to provide good initial adhesion and, more importantly, excellent, permanent adhesion of BITUTHENE® waterproofing membranes under many kinds of conditions.
2.3 GREEN CONCRETE SUBSTRATE PRIMER
BITUTHENE PRIMER TYPE C – water-based membrane primer for walls over 7 days old.
2.4 PRIMER - FOR ICF FORMWORK
When Bituthene 3000 is applied to ICF formwork, this needs to be done using Nuraflux No 10 water-based adhesive primer to prime the substrate, Nuraflux No 10 acts as a primer and separation layer between the Bitumen from the membrane and polystyrene layer of the formwork. After the ICF has been primed with Nuraflux No 10, the Bituthene 3000 is applied to the ICF formwork as per the standard Nuralite installation instructions.
2.5 Polymer Permanent Formwork: When Bituthene 3000 is applied to Polymer Permanent Formwork e.g., Dincel, priming of the substrate is not required. Prior to membrane application the plastic formwork is cleaned and wiped down using a PVC solvent, after the formwork has been wiped down with the solvent the Bituthene 3000 is applied to the clean for work as per the standard Nuralite installation instructions.

Materials - Preprufe®
2. 6 PREPRUFE SHEET TANKING & WATERPROOFING MEMBRANE
Modified heavy duty sheet comprising of modified adhesive on a heavy polyethylene face.
Preprufe® 300R Plus is a 1.2m wide x 30m long roll.
2.7 Preprufe®160R Plus is a pre–applied, multi-layered composite sheet comprising of an HDPE film, pressure sensitive adhesive and a weather-resistant protective coating used for use as a below ground DPM or tanking membrane. Preprufe® 160R Plus is a thinner grade used for vertical applications. It is supplied in a roll 0.8 mm thick x 1.2 m wide x 36.8 m long.
2.8 PREPRUFE TAPE
Self-adhesive tape for sealing Preprufe® end laps, cut edges and detailing Preprufe® to piles, penetrations.
2.9 PREPRUFE CJ TAPE
Self-adhesive tape for detailing Preprufe® at construction joints and detailing Preprufe® to piles.
2.10 PREPRUFE TIEBACK COVERS
Pre-formed, high strength dome covers for fast waterproofing over tie backs.
2.11 PREPRUFE DETAIL TAPE
Double sided, self-adhesive tape for specialized membrane detailing.

Materials – Components
2.12 DRY CONCRETE SUBSTRATE PRIMER
BITUTHENE® SOLVENT PRIMER is a bitumen-based primer in solvent which is specifically formulated to provide good initial adhesion and, more importantly, excellent, permanent adhesion of BITUTHENE® waterproofing membranes under many kinds of conditions.
2.13 GREEN CONCRETE SUBSTRATE PRIMER
BITUTHENE PRIMER TYPE C water-based membrane primer.

2.14 BITUTHENE LIQUID MEMBRANE LM3000

Two-part asphalt-polyurethane mastic, for fillet forming and all other detailing of BITUTHENE and PREPRUFE membranes.

2.15 SWELLSEAL MASTIC WA

Hydrophilic polyurethane mastic for detailing starter bars and forming hydrophilic waterstops to rough concrete surfaces.

2.16 ADCOR 500T

A conformable, swellable polymer/butyl rubber waterstop strip that expands in contact with saline and brackish water. When fully encapsulated by poured concrete, the expansive forces form a seal against concrete faces. The seal resists hydrostatic pressure, stopping water from entering sub-structures.

2.16 ADCOR 500S

A conformable, swellable polymer/butyl rubber waterstop strip that expands in contact with water. When fully encapsulated by poured concrete, the expansive forces form a seal.
against concrete faces. The seal resists hydrostatic pressure, stopping water from entering sub-structures.

2.17 NURAPATCH - Smoothing compound for concrete walls.

2.18 BITUTHENE MASTIC - IKO Stickall Bitumen

2.19 NURADRAIN POLYETHYLENE PROTECTION SHEET

Dimpled rot-proof board for use as a protective barrier and drainage medium behind retaining walls.

2.20 DRAINAGE / PROTECTION SHEET - FIXINGS

Nuradrain self-adhesive mechanical fixings for Nuradrain sheets

2.21 INSULATION SHEET – ENERTHERM PIR

Enertherm is a closed cell rigid polyisocyanurate insulation board exhibiting a high compressive strength, clad on both sides with a multi-layer gastight aluminium complex.

2.22 INSULATION SHEET - ALUMINIUM TAPE

3M 150mm & 48mm wide Aluminium tape for taping edges and joints to Enertherm PIR insulation sheets.

2.23 INSULATION SHEET - WATERPROOF COATING

NURACOAT BG is a water based, high performance, cold applied, high build liquid waterproofing membrane for coating Enertherm PIR insulation sheet.

2.24 INSULATION SHEET - ADHESIVE

Selleys water-based Kwik Grip, for spot fixing of Enertherm PIR insulation sheet.

2.25 TOP EDGE ANCHOR STRIP

Aluminium termination bar.

2.26 INSULATION SHEET - EXPANDING FOAM

Soudal Gorilla Nailpower fire rated expanding foam.

2.27 GROUT - PILE CAP EPOXY POURABLE GROUT

Maintains continuity of Preprufe® and Nuraply waterproofing systems at pile heads and similar structural penetrations.

3 EXECUTION

3.1 EXECUTION

3.1 COMPLY

Comply with the NURALITE Waterproofing Limited requirements and instructions.

3.2 PLAN LAYOUT

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

3.3 WEATHER CONDITIONS

Apply NURALITE waterproofing systems tanking systems only in fair weather with air temperature above 5°C. Apply adhesives and make site joints only in weather conditions compatible with perfect jointing.

3.4 STORE

Store NURALITE waterproofing systems rolls and accessory materials under conditions that ensure no deterioration or damage. Store in shade or cover in hot sun. Protect liquid components from freezing.

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3.5 DE-WATERING

Maintain water level at not less than 300mm below the level of the base concrete during the progress of the tanking work and until protective loading coats and walls are complete and fully set.

3.6 DRAINAGE

Install approved drainage system to remove water from foundations. Ensure drain is protected with geotextile cloth to prevent it clogging with fines, and that it is correctly located, 150mm from the membrane and below the footing.

3.7 CHECK SUBSTRATE

Check that the substrate will allow work of the required standard with adequate safe working space for applicators. Complete any remedial work identified and allow to cure before commencing tanking application.

3.8 CURING OF NEW CONCRETE

Allow concrete and masonry to dry to the NURALITE Waterproofing Limited requirements before applying tanking. Recommended curing of new concrete: 28 days. This is not applicable for blockwork or site lean concrete. Special attention and methods for installation between 7 and 28 days of pour.

Application - preparation

3.9 ENSURE SUBSTRATE

Ensure all surfaces are clean and free from voids, spalled areas, loose particles, and sharp protrusions. Ensure no projections of sharp materials exist that will cause damage to tanking. Check that masonry joints are struck off flush.

Ensure form oils or release agents and curing compounds are completely removed.

3.10 PREPARE SUBSTRATE

Remove projections, wire-brush and remove all debris, leaving the surface dust-free, oil-free and clean, with nothing that could diminish the adhesion of primers. Fill tie holes flush and smooth with NURAPATCH. Grind off steps or sharp protrusions caused by formwork joints.

3.11 TURN UPS

Where tanking is turned up against hardened concrete, ensure the surface is smooth and free of all sharp projections. Fill internal corners with a fillet of BITUTHENE LM.

3.12 TURN DOWNS

Where Bituthene® is turned over an external corner, first grind the corner to produce a smooth 15mm radius or chamfer.

3.13 CLEAN SURFACES

Clean surfaces with a broom or oil free compressed air to remove dust, loose particles and material that could affect bonding.

3.14 DRESS OFF HARDFILL SURFACE

Dress off surface of hardfill with a 15mm layer of fine, clean sand rolled to a smooth surface. Ensure concrete surface is a smooth steel trowel U3 surface to NZS 3114. Grind off any steps or sharp protrusions.

3.15 REMOVE BACK FORMS

Remove back forms to ensure no vapour pressure develops beneath the membrane.

Application - Preprufe® - Under Slab

3.16 INSTALL PREPRUFE 300R PLUS

Place Preprufe® 300R Plus membrane HDPE side to the substrate with the coat adhesive face towards the concrete pour. Place sheets to overlap the previous sheet 75mm along the marked selvedge with end laps staggered. Peel back green top side and blue underside release liners simultaneously while bonding laps together. Ensure a continuous bond is achieved without wrinkles and roll firmly with a heavy roller. For roll ends and cut edges overlap by a minimum 75mm. Apply Preprufe® tape centred over the lap and roll firmly.

Install the reinforcing steel (by others).

3.17 WALL/FLOOR CONSTRUCTION JOINT

Protrude the under slab Preprufe® membrane beyond the perimeter of the footing by a minimum 150mm to allow for the required wall / floor joint.

Form joint between Preprufe® under slab tanking membrane and wall tanking membrane in accordance with Nuralite Waterproofing Ltd requirements and details. Run the vertical material over the outside of the underfloor sheet to ensure correct discharge of any water.

Install selected hydrophilic waterstop to all wall/floor construction joints.

3.18 WALL/FLOOR CONSTRUCTION JOINT – WITH PREPRUFE WALL MEMBRANE

Form joint between Preprufe® under slab tanking membrane and Preprufe® wall membrane, in accordance with Nuralite Waterproofing Ltd requirements and details.

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Extend the under slab Preprufe® membrane beyond the perimeter of the floor slab to allow membrane to extend a minimum 400mm above slab level and protect during floor slab pour from over splash.

Form taped joint to Preprufe® installed under slab, overlap Preprufe® membrane sheets of 75mm to the marked line, ensure underside of sheet is clean, dry and free from contamination at overlap. Peel back green top side and blue underside release liners simultaneously while bonding laps together, then roll with a heavy roller to seal, without wrinkles. If in any doubt about the joint, re-seal the joint area with Preprufe® Tape.

Install selected hydrophilic waterstop to all wall/floor construction joints.

3.19 DETAILING TO PILES - PILE TOP PROUD OF BLINDING

Install Preprufe® membrane to blinding and around pile with 10mm clearance. Cut a square of Preprufe® membrane at least 150mm larger than pile. Mark pile diameter on Preprufe® square and pie-cut membrane on inside of mark. Pie cuts to be minimum 75mm long.

Install minimum 25mm x 25mm fillet of Bituthene® LM to pile Preprufe® turn-up. Extend Bituthene® LM at 2.5mm thick, 75mm up pile and 75mm to Preprufe®.

Place Preprufe® pie-cut square, and place over pile and bed fully into Bituthene® LM fillet. Bituthene® LM must fill all gaps between pie-cuts and pile. Wrap Preprufe® Tape around pie-cut fingers (while progressively removing release films), over Bituthene® LM and up pile to fully seal.

Seal Preprufe® cut square to underlying Preprufe® membrane using Preprufe® Tape. Roll all Preprufe® Tape with a roller to seal without wrinkles. Apply a 20mm fillet of Bituthene® LM at all pile starter bar junctions. Apply 10mm diameter bead of Swellseal Mastic WA around each starter bar, 100mm from pile top.

3.20 DETAILING TO PILES - PILE TOP FLUSH WITH BLINDING

Install Preprufe® membrane to blinding, lapping onto pile top a minimum 50mm to 100mm. Mark membrane edge on pile top. Lift membrane to expose pile top. Remove release film. Apply Bituthene® LM at 2.5mm thick to pile top, extending to the mark.

Install Preprufe®, laying membrane into Bituthene® LM, ensuring it is fully bedded without gaps. Apply Bituthene® LM to membrane termination edge, extending 50mm onto Preprufe® and 50mm onto pile top to seal fully.

Apply a 20mm fillet of Bituthene® LM at all pile starter bar junctions. Apply 10mm diameter bead of Swellseal Mastic WA around each starter bar, 100mm from pile top.

3.21 DETAILING TO PENETRATIONS - PIPES, DEWATERING WELLS, ETC

Install Preprufe® membrane to blinding and around penetration with 10mm clearance. Cut a square of Preprufe® membrane at least 150mm larger than penetration. Mark penetration diameter on Preprufe® square and pie-cut membrane on inside of mark. Pie cuts to be minimum 50mm long.

Install minimum 25mm x 25mm fillet of Bituthene® LM to penetration Preprufe® turn-up. Extend Bituthene® LM at 2.5mm thick, 75mm up penetration and 75mm to Preprufe®.

Remove release film from Preprufe® pie-cut square, and place over penetration and bed fully into Bituthene® LM fillet. Bituthene® LM must fill all gaps between pie-cuts and penetration. Wrap Preprufe® Tape around pie-cut fingers (while progressively removing release films), over Bituthene® LM and up penetration to fully seal.

Seal Preprufe® cut square to underlying Preprufe® membrane using Preprufe® Tape. Roll all Preprufe® Tape with a -roller to seal without wrinkles. Apply 10mm diameter bead of Swellseal Mastic WA around penetration, 100mm from blinding.

3.22 PROTECT HORIZONTAL SURFACES

Protect the horizontal tanking from damage during laying by ensuring applicators wear soft soled shoes. Except for inspection and reinforcement placement purposes do not allow traffic on the tanking after installation.

3.23 SUPERVISION OF CONCRETE POUR

Membrane installer to supervise concrete placement operations to ensure no damage is caused to the waterproofing system. Refer to the appropriate concrete section.

Application - Preprufe® – Walls if Blindside Tanking (delete section if not applicable)

3.24 SUBSTRATE PREPARATION – ROCKFACE

Ensure rockwork is stable, sound, and smooth with variations less than 12mm. Protrusions larger than 12mm shall be removed. Large voids shall be faced with shotcrete, struck smooth and level with adjacent surface. Small voids can be patched with a high strength, low shrink cementitious repair mortar.

Where repair to rockface void is not possible, a plywood, timber, or other formwork to be used.

3.25 SUBSTRATE PREPARATION - FORMWORK

Ensure formwork has been erected in accordance with Nuralite Waterproofing Limited requirements. Ensure formwork is close butted, smooth, and stable and not more than 12mm out of alignment. Ensure formwork has been designed to resist the weight and force of concrete placement with movement or deflection.

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3.26 INSTALL PREPRUFE 300R or 160R PLUS

Install Preprufe® 300R or 160R Plus on vertical lagging with its adhesive face presented to receive fresh concrete, tack top edge in place using small head nail.

Overlap sheets 75mm, peel back green top side and blue underside release liners simultaneously while bonding laps together, then roll with joint roller. If in any doubt about the joint, re-seal the joint area with Preprufe® Tape and roll with joint roller to seal, without wrinkles.

3.27 WALL/FLOOR CONSTRUCTION JOINT

Install Preprufe CJ Tape centred over floor / wall construction joint. Form overlaps in Preprufe® membrane wall / slab sheets of 75mm to the marked line, ensure underside of sheet is clean, dry, and free from contamination at overlap, if required clean surface with a damp cloth. Peel back green top side and blue underside release liners simultaneously while bonding laps together, then roll with a heavy roller to seal, without wrinkles. If in any doubt about the joint, re-seal the joint area with Preprufe® Tape.

Run the vertical material over the outside of the underfloor sheet to ensure correct discharge of any water.

3.28 TERMINATION AT TOP

The upper (top) edge will normally be terminated at ground level. Secure the top edge with a mechanically fastened metal strip and sealant or by using Nuralite termination bar. Complete selvedge edge strip with Bituthene® LM Liquid Membrane. Complete end laps and / or cut sheets with Preprufe® tape. Roll with joint roller to seal, without wrinkles.

If the upper termination area is above ground, protect from UV and damage using fibre cement board.

3.29 DETAILING OF TIE BACKS

Install Preprufe® 300R Plus membrane to wall, cutting around tie backs to give 10mm clearance.

Screw fix ABS cover of Preprufe® Tie Back Cover over tie back. Install Preprufe® Tape to flange of tie back cover. Remove release film from tape. Position Preprufe® cover of Preprufe® Tie Back Cover over the ABS cover and press firmly into Preprufe® Tape.

Roll all Preprufe® Tape with joint roller to seal, without wrinkles.

3.30 DETAILING TO PENETRATIONS - PIPES ETC

Install Preprufe® 300R Plus membrane to wall formwork and around penetration with 10mm clearance. Cut a square of Preprufe® 300R Plus membrane at least 150mm larger than penetration. Mark penetration diameter on Preprufe® square and pie-cut membrane on inside of mark. Pie cuts to be minimum 50mm long.

Install minimum 25mm x 25mm fillet of Bituthene® LM to penetration Preprufe® turn-up. Extend Bituthene® LM at 2.5mm thick, 75mm up penetration and 75mm to Preprufe®.

Place Preprufe® pie-cut square over penetration and bed fully into Bituthene® LM fillet. Bituthene® LM must fill all gaps between pie-cuts and penetration. Wrap Preprufe® Tape around pie-cut fingers (while progressively removing release films), over Bituthene® LM and up penetration to fully seal.

Seal Preprufe® cut square to underlying Preprufe® membrane using Preprufe® Tape. Roll all Preprufe® Tape with joint roller to seal without wrinkles. Apply 10mm diameter bead of Swellseal Mastic WA around penetration, 100mm from formwork.

3.31 SUPERVISION OF CONCRETE POUR

Membrane installer to supervise concrete placement operations to ensure no damage is caused to the waterproofing system. Refer to the appropriate concrete section.

Application - Bituthene® – On Walls (delete section if not applicable)

3.32 SUBSTRATE PREPARATION

Ensure all surfaces are clean and free from voids, spalled areas, loose particles, and sharp protrusions. Check that masonry joints are struck off flush, if not flush point blockwork with Nurapatch.

Remove all sharp projections, wire-brush and remove all debris, leaving the surface dust-free, oil-free and clean, with nothing that could diminish the adhesion of primers or cause damage to the tanking. Ensure form oils or release agents and curing compounds are completely removed.

Repair surface imperfections including voids greater than 12mm and fill tie holes flush and smooth with Nurapatch. Grind off steps or sharp protrusions caused by formwork joints.

Clean surfaces with a broom or oil free compressed air to remove dust, loose particles and material that could affect bonding.

3.33 TURN UPS

Where tanking is turned up against hardened concrete, ensure the surface is smooth and free of all sharp projections. Fill internal corners with a 20mm x 20mm fillet of Bituthene® LM.

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3.34 TURN DOWNS

Where tanking is turned over an external corner, first grind the corner to produce a smooth 15mm radius or chamfer.

3.35 REMOVE BACK FORMS

Remove back forms to ensure no vapour pressure develops beneath the membrane.

3.36 PRIMING

Select primer based on condition of the wall and apply in accordance with NURALITE Waterproofing Ltd specifications and application instructions. Apply membrane primer as per selected primers coverage rate with a roller. Allow primer to fully dry off before applying the membrane. Only prime areas which are receiving the membrane on the same day.

3.37 INSTALL BITUTHENE 3000

Progressively peel back the protective release paper and apply Bituthene® 3000 membrane to the primer substrate. Membrane to be firmly smoothed and brushed onto surface to ensure free of air bubbles and wrinkles. Overlap sheets minimum 50mm at selvedge, lined up with printed guideline on the membrane and end laps and cuts are to be overlapped 150mm minimum. Pressure roll all edges and end laps.

3.38 REINFORCE CORNERS AND CONSTRUCTION JOINTS

Reinforce all internal corners, external corners, and construction joints (including joint between concrete blockwork and footing) with a 300mm min strip of Bituthene® 3000 before overlaying with the Bituthene® 3000 sheet membrane.

3.39 DETAILING TO PENETRATIONS - PIPES ETC

Install minimum 25mm x 25mm fillet of Bituthene® LM to penetration. Extend Bituthene® LM at 2.5mm thick, 75mm up penetration and 75mm to Bituthene® 3000 membrane. Ensure specified waterstop is installed between penetration and concrete wall.

3.40 TERMINATION AT BASE – WITH PREPRUFE 300R PLUS UNDERSLAB

Form joint between Preprufe® 300R Plus under slab tanking membrane and Bituthene® 3000 wall tanking, in accordance with Nuralite Waterproofing Ltd requirements and details. Run the Bituthene® 3000 vertical material over the outside of the Preprufe® underfloor sheet to ensure correct discharge of any water.

Bituthene® 3000 to extend to the base of slab/footing or a minimum 200mm below finished floor level. Seal the Bituthene® 3000 to the toe or footing on the vertical face.

and finish with a strip of Bituthene® LM Liquid Membrane to bottom edge.

3.41 TERMINATION AT BASE

Seal the Bituthene® 3000 to the toe or footing on the vertical face. Finish with a strip of Bituthene® LM Liquid Membrane to bottom edge. Wrap under slab vapour barrier over Bituthene® 3000 and provide a Bituthene® 3000 cover strip allowing for 150mm lap joint.

3.42 TERMINATION AT TOP – TERMINATION STRIP

The upper (top) edge will normally be terminated at ground level. Secure the top edge with a mechanically fastened metal strip or Nuralite aluminium strip.

Bed fastening strips in Bituthene® LM Liquid Membrane and complete strip with Bituthene® LM Liquid Membrane.

3.43 TERMINATION AT TOP – FORM INTO CHASE

If the upper termination area is above ground, secure the top edge of Bituthene® 3000 into chase in substrate. Finish with metal flashing, selected sealant bead and fibre cement board or similar to protect from UV and damage.

3.44 TERMINATION AT TOP – FOR PLASTER FINISH

If the upper termination area is above ground, secure the top edge of Bituthene® 3000 with CJ Tape. The plaster must be applied within 40 days.

3.44 INSTALL ENERTHERM PIR INSULATION SHEETS

Tape any exposed edges of PIR with 150mm foil tape before installing. Neatly scribe and fit sheets, spot fixing them with Selleys Water-Based Kwik Grip adhesive. Tape all PIR joins with 48mm foil tape once installed. If required coat with Nuracoat BG, (optional), to Nuralite Waterproofing Ltd requirements, to fully protect and insulate the whole of the tanking area.

3.45 INSTALL NURADRAIN PROTECTION SHEETS

Install Nuradrain in accordance with Nuralite Waterproofing Ltd requirements. Install

Install Nuradrain in accordance with Nuralite Waterproofing Ltd requirements. Install Nuradrain with raised geotextile side against membrane or over Enertherm PIR Insulation sheets if using. Butt sheet joints and tape vertically and hold in place using Nuralite adhesive tape and/or Nuradrain self-adhesive mechanical fixings to Nuralite requirements.

3.46 SUPERVISION OF BACKFILLING

Supervise backfilling operations to ensure no damage is caused to the waterproofing system.

Backfilling



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3.47 SUPERVISION OF BACKFILLING

Membrane installer to supervise backfilling operations to ensure no damage is caused to the waterproofing system. Refer to the appropriate drainage section for subsoil drainage and backfilling.

Application - Terminations / Flashings

3.48 TERMINATIONS/FLASHINGS

Use an NURALITE Waterproofing Ltd Standard detail to:

- mechanically fasten and terminate the top edge of the membrane.
- terminate the membrane over the under-slab protection at the wall base.

Completion

3.49 CLEAN UP

Clean up as the work proceeds.

3.50 LEAVE

Leave this work in a sound, coherent, void less and impermeable smooth condition, completely waterproof, free of any defect and with protection sheets firmly in place.

3.51 REMOVE

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

4 SELECTIONS

4.1

For further details on selections go to www.nuralite.co.nz

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

Performance

4.1 PRESSURE RATING

Designated water pressure head: ~ metres

Tanking Systems

4.2 UNDERSLAB TANKING - PREPRUFE 300R PLUS

Location:	~
Substrate:	~
Tanking:	Preprufe 300R Plus
Components:	Preprufe Tape, Preprufe CJ Tape & Preprufe Detail Tape
Tanking sealant	Bituthene® LM
Accessories:	~

4.3 WALL TANKING (BLINDSIDE APPLICATIONS) - PREPRUFE 300R or 160R PLUS

Location:	~
Substrate:	~
Drainage mat:	Nuradrain
Tanking:	Preprufe 300R or 160R Plus
Components:	Preprufe Tape, Preprufe CJ Tape, Preprufe Detail Tape, Preprufe Tie back covers
Tanking sealant	Bituthene® LM

4.4 WALL TANKING - BITUTHENE 3000

Location:	~
Substrate:	~
Preparation:	Nurapatch, if required
Primer:	~
Tanking:	Bituthene 3000
Tanking sealant	Bituthene® LM
Accessories:	~

Insulation

4.5 NURAPLY INSULATION SHEETS

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Location: ~
Supplier: Nuralite Waterproofing Limited
Brand: Enertherm ALU Insulation Board, straight edge
Thickness: ~
R value: ~
Components: 48mm & 150mm aluminium tape,
Soudal Gorilla Nailpower fire rated expanding foam
Adhesive: Selleys Water-Based Kwik Grip
Waterproofing: Nuracoat BG coating (optional)

Protection / Drainage Sheet

4.6 NURAPLY DRAINAGE SHEETS
Location: ~
Supplier: Nuralite Waterproofing Limited
Brand: Nuradrain

Hydrophilic Components

4.7 HYDROPHILIC WATERSTOP
Location: ~
Brand / type: SwellSeal® 500T or Adcor 500S

4.8 HYDROPHILIC MASTIC
Location: ~
Brand / type: Swellseal Mastic WA

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4161 UNDERLAYS, FOIL AND DPC

1 GENERAL

This section relates to the application of:

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

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

Requirements

1.3 INSTALLATION SKILL LEVELS

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

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2 PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

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

DPM

2.2 DAMP PROOF MEMBRANE - CONCRETE FLOOR

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

Wall Underlays

2.3 NON-ABSORBENT SYNTHETIC WALL UNDERLAY - POLYOLEFIN (W3)

Non-absorbent, breathable very fine high density white polyolefin fibres bonded with heat and pressure to form a wide sheet.

Roofing Underlay

2.4 SYNTHETIC NON-WOVEN SELF SUPPORTING ROOFING UNDERLAY (R4)

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

Accessories

2.5 WINDOW DOOR SEALING SYSTEM

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

2.6 STUD STRAPS

19mm wide polyethylene straps, for cavity construction with framing centres greater than 450mm.

2.7 GUTTER AND UNDER FLASHINGS

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

2.8 ADHESIVE TAPE

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

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

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

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

3.2 STORAGE

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

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3.3 INSPECTION

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

Application - DPC

3.4 POLYETHYLENE DPC TO TIMBER

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

3.5 DPC TO MASONRY AND BRICK VENEER

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

3.6 DPC BETWEEN DISSIMILAR MATERIALS

Lay DPC between dissimilar materials where required.

Application - DPM

3.7 DPM TO CONCRETE FLOOR

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

Application - Wall Underlay

3.8 WALL UNDERLAY

Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, 9.1.6 Wall underlay, and refer to manufacturer for requirement for fastenings. Fix to manufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

3.9 INSTALL STUD STRAPS

Over underlay, install 19mm wide polyethylene straps horizontally at 300mm centres, draw taut and fix to studs with stainless steel staples.

3.10 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of underlay to face of batten before fixing the metal cladding.

Application - Roofing Underlay

3.11 ROOF UNDERLAY

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

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

3.12 GUTTER AND UNDER FLASHINGS

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

Completion

3.13 CLEAN UP

Clean up as the work proceeds.



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3.14 LEAVE

Leave work to the standard required by following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.



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4221JW JSC THERMALLY MODIFIED TIMBER VERTICAL WB

1 GENERAL

This section relates to the supply and fixing of JSC vertical cladding systems for **JSC-TMT®** Thermally Modified Timber product.
It includes;

- JSC-TMT® Vertical shiplap weatherboards
- JSC-TMT® Board and Batten weatherboards
- JSC Proprietary Coating
- Proprietary cavity battens
- Fascia
- Moulding

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

Refer to relevant EXTERIOR PAINTING section for acrylic exterior paint

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:

TMT®	Thermally Modified Timber
DF	Dressed face
BSF	Band sawn face

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZS 1170.5	Structural Design Actions - Part 5: Earthquake actions
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring
NZS 3631	New Zealand timber grading rules
BRANZ BU 411	Recommended Timber Cladding Profiles
CodeMark™ CMNZ30083verJ	JSC Board & Batten Cladding System
CodeMark™ CMNZ30084verQ	JSC VertiClad Cladding System

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

- JSC VertiClad Vertical Shiplap Weatherboard Cladding Installation Guide v3.7
- JSC VertiClad Vertical Shiplap Weatherboard Cladding Design Guide v1.1
- JSC VertiClad Vertical Shiplap Weatherboard System Technical Drawings
- JSC Verticlad System Installation Checklist
- JSC Board & Batten Weatherboard Cladding Installation Guide v3.7
- JSC Board & Batten Weatherboard Cladding Design Guide v1.0
- JSC Board & Batten Weatherboard System Technical Drawings
- JSC Board & Batten System Installation Checklist
- JSC Profile Charts

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- JSC Exterior Weatherboard Maintenance Guide
- JSC Structural Cavity Batten Setout and Fixing Guide
- JSC 20mm Cavity Setout For Vertical Weatherboards
- JSC Coatings Exterior Wood Oil Range

Manufacturer/supplier contact details

Company:	J.Scott and Company Ltd.
Trading as:	JSC
Web:	www.jsc.co.nz
Email:	techhelp@jsc.co.nz
Telephone:	Auckland 09 412 2800 Christchurch 03 348 9726

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 or associated product listed in this section.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for the requirements for submission and review of operation and maintenance manuals.

Provide the following operation and maintenance manual(s) prior to Practical Completion:

- JSC Maintenance Guide

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:-

- Signed declaration that the JSC product has been installed in accordance with the installation conditions of the CodeMark certificate.
- Other information required by the BCA in the Building Consent Approval documents.

1.9 CODEMARK CERTIFICATE CMNZ30084

The JSC VertiClad cladding system meets the requirements of the NZBC when used within the Conditions and Limitations of its CodeMark Certificate of Conformity CMNZ30084.

1.10 PERFORMANCE - GENERAL

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To NZBC B2/AS1, NZBC E2/AS1 and grading to NZS 3631. Refer to JSC Weatherboard Cladding Installation guides.

Ensure the relevant JSC Weatherboard Cladding System Installation Checklist has been signed off by the main contractor on completion.

Performance - wind

1.11 FIXINGS - WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604. Refer to JSC Weatherboard Cladding Installation guides.

Performance - fire

1.12 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External cladding Systems, NZBC C/AS2, 5.5 External cladding systems, where external walls are located at a distance greater than or equal to 1.0m from a relevant boundary and a building height less than 10m.

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Performance - earthquake

1.13 FIXINGS, EARTHQUAKE

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

Quality control and assurance

2 PRODUCTS

Materials

2.1 JSC-TMT® THERMOPINE®

JSC-TMT® ThermoPine® and JSC-TMT® ThermoPine® with H3.2 MicroPro® treatment are thermally modified, dimensionally stable timber. Manufactured from single-piece, solid timber profiles with a warm colour tone.

Components

2.2 VERTICAL SHIPLAP WEATHERBOARDS

Selected timber weatherboards machined to JSC-TMT® profiles, lap and rebate details to BRANZ BU 411, and general design to NZS 3617.

2.3 ASSOCIATED MOULDING

To JSC-TMT® profiles as detailed. Refer to SELECTIONS and JSC Weatherboard Cladding System Technical Drawings.

2.4 FASCIA BOARDS

To JSC-TMT® profiles as detailed. Refer to SELECTIONS and JSC Weatherboard Cladding System Technical Drawings.

2.5 CAVITY BATTEN - STRUCTURAL

JSC-H, JSC-V and JSC; CCA 3.2 treated Radiata Pine timber structural battens, used horizontally, are castellated on both faces with 18 degree slope to provide drainage and ventilation. Sizes: JSC-H: 45mm x 45mm, JSC-V: 45mm x 45mm and JSC: 45mm x 70mm

Treatment to NZBC B2/AS1 and NZS 3602, table 1, reference 1D.10.

2.6 CAVITY BATTENS - NON-STRUCTURAL

JSC-U; CCA 3.2 treated Radiata Pine timber non-structural battens are castellated on both faces with 18 degree slope to provide drainage and ventilation. Sizes: 45mm x 20mm

Treatment to NZBC B2/AS1 and NZS 3602, table 1, reference 1D.10.

2.7 WALL UNDERLAY

To NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays. For flexible wall underlays and DPC refer to the appropriate separate section(s).

2.8 CAVITY CLOSER/VERMIN-PROOFING

Perforated UPVC, aluminium or stainless steel trays with upstands. Flashing to NZBC B2/AS1, Table C.1.1.1, NZBC E2/AS1, 4.0 Flashings, PBS vermin closure to NZBC E2/AS1, paragraphs 9.1.7.5 - 9.1.7.7.

2.9 NAILS

Stainless steel or silicon bronze annular grooved nails with flat, rose or pentagon head, refer to JSC Weatherboard Cladding Installation Guides for fixing details.
NOTE: Select appropriate nail size / length to achieve the minimum required embedment into the framing as per installation guide.

2.10 CLINCH NAILS

40mm x 2.0mm Clinch Nail, annular grooved shank grade 316 stainless steel or silicon bronze. Used to retain hidden lap tongues of rebated weatherboard profiles such as vertical shiplap. Refer to JSC Weatherboard Cladding Installation Guides for fixing details.

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2.11 FLASHING

To NZBC E2/AS1, 4.0 Flashings. Material, grade and colour as detailed and scheduled and to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off. Ensure materials used for flashing are compatible with the exterior joinery materials, fixings and cladding materials.

Finishes

2.12 JSC-TMT® WEATHERBOARD SYSTEM COATING REQUIREMENTS

All JSC weatherboards including mouldings must be coated on all sides before installation and finished with topcoats of suitable exterior grade stain to the coating manufacturer's specification.

2.13 JSC FACTORY COATING

JSC In-house factory coating system involves applying the first coat of selected coating using vacuum coating machines under controlled conditions.

2.14 SITE-APPLIED COATING

During installation all end grain, bare surfaces and cut edges must be minimum double coated. Additional coating/s to be applied on-site to coating manufacturer's specifications.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 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 14 - 18% maximum at fixing

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 GENERALLY

Execution to NZBC E2/AS1, 3.0 Weather-tightness risk factors, NZBC E2/AS1, 9.1.7 Drained cavities and 9.4 Timber weatherboards.

3.6 SUBSTRATE

Before starting cladding fixing ensure that the substrate conforms to NZS 3604 and NZS 3604:6 Foundation and sub-floor framing and NZBC E2/AS1, 9.4 Timber weatherboards.

Application - preparation/general

3.7 JSC FACTORY COATING - STAIN / OIL

JSC In-house factory applied coating system ensures the selected coating is applied on all 4x sides of weatherboard profiles within a controlled environment delivering a full envelope seal and a premium finish. Additional coatings may need to be applied on site as per the coating manufacturer's recommendations.

3.8 SITE-STAINING OR PRIMING AND SEALING

All JSC uncoated thermally modified timber weatherboards must be coated with one coat of suitable stain to JSC specification on all four sides prior to installation.

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Open stack each board to dry with the back facing down, ensuring the surfaces remain well finished, untouched and unblemished. Once dry, place boards in fillet stack, laid flat and true, until fixed. All end grain, bare surfaces and cut edges must be coated twice prior to installation.

3.9 CAVITY CLOSER/VERMIN-PROOFING

Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters, etc.) to JSC Weatherboards Cladding Installation Guides.

Fix 75mm upstand to framing one side and 10mm upstand to cladding the other. Length and width to suit cavity.
Ensure openings in cavity closer/vermin-proofing are kept clear and unobstructed in order to maintain draining and venting of the cavity.

3.10 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 to JSC Weatherboards Cladding Installation Guides.

Required preparatory work includes the following:

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

Application - cavity battens

3.11 INSTALLATION - HORIZONTAL NON-STRUCTURAL CAVITY BATTENS

Install JSC-U 45mm x 20mm cavity battens horizontally over the nogs and vertically at corners and around openings. When installed horizontally, JSC-U cavity battens to be installed sloping away from the wall underlay towards the back of weatherboards ensuring water is shed away from the framing. Install to JSC 20mm Cavity Setout For Vertical Weatherboards instructions.

The non-structural battens to be fixed temporarily using 50mm stainless steel clouts over the wall underlay and then firmly fixed by cladding fixings.

Seal the top of the cavity and install cavity closer/vermin proofing at the base of walls, open horizontal (or raking) junctions, over openings (windows, meters, etc.)

3.12 INSTALLATION - HORIZONTAL STRUCTURAL CAVITY BATTENS

Install to JSC Structural Cavity Batten Setout and Fixing Guide instructions.

Horizontal structural battens to be fixed permanently to studs using stainless steel fastenings with minimum fixing tension per lineal meter of batten to transfer all applied load back to the framing.

All accessory components including vermin proofing, cavity closures, back flashing and head flashing to be custom designed to accommodate the cavity.

Application - weatherboards

3.13 SET-OUT

Using laser or mechanical devices set-out the overlap boards to ensure dimension to exposed face in line of weather is constant and that boards remain true. Use a string line to set out all nailing that will be visible in the finished work. Align all nailing accurately in straight lines.

3.14 FIXING - OILED / STAINED TIMBER FINISH

Install to NZBC E2/AS1, 9.4 Timber weatherboards. Coat all cut edges before fixing with JSC specified oil/stain product. Pre-drill all fixings 1mm smaller than nail gauge to ensure a snug fit and to minimise risk of moisture entry. Finish the nail heads flush onto and not into the board surface. Do not 'over drive' the nail head and crush the timber surface beneath and surrounding the nail.

Refer to JSC Weatherboards Cladding Installation Guides for fixing sizes and details.

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3.15 FIXING JSC® VERTICAL SHIPLAP WEATHERBOARDS

Install to JSC® VertiClad Vertical Shiplap Weatherboards Cladding Installation Guide.

Using laser or mechanical devices, set out all nailing accurately in straight lines. Align weather grooves to ensure there is a 2mm expansion gap between lapped boards.

JSC TMT® Vertical Shiplap Weatherboards must be pre-drilled with a slight (0-2°) upward slope, 1mm smaller than the nail shank to reduce moisture entry. Single-fix each weatherboard at 35mm from the overlapping edge of the weatherboard. Refer to installation guide for minimum embedment of nails into the framing.

Note: Where vertical weatherboards have an exposed bottom edge such as at the bottom plate, window head, inter storey junction, overhead soffit junction, etc., the bottom edge of the weatherboards to be cut with a 15° degree slope to form a drip edge. From the bottom edge, the back of the weatherboards to be coated up to 75-150mm prior to installation.

All corners to be weatherproofed using corrosion resistant back flashing behind the weatherboards at all external corners to JSC VertiClad Vertical Shiplap Weatherboard Cladding Installation Guide.

Ensure all cut edges are double sealed and manufacturer's coating schedules adhered to prior to installation.

Application - Ancillary

3.16 WINDOW FIXING

Fix windows to JSC Weatherboards Cladding Installation Guides.

3.17 FLASHING

Fix to JSC Weatherboard Cladding Installation Guide. Material compatibility to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

3.18 SCRIBERS

Scribers are to be wet-sealed in place and fixed in accordance with JSC Weatherboard Cladding Installation Guide.

Completion & Commissioning

3.19 COMPLETION MATTERS

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



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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

4239JH JAMES HARDIE SOFFITS for James Hardie soffit lining

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	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
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 2024
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 - Amended 16 June 2026

Manufacturer/supplier contact details

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

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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 EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External cladding systems or NZBC C/AS2, 5.5 External cladding systems, where external walls are located at a distance greater than or equal to 1.0m from a relevant boundary and a building height less than 10m.

2 PRODUCTS

Materials

2.1 WALL UNDERLAY

Refer to section 4161 UNDERLAYS, FOIL AND DPC.

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™ Structural 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.

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

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 FRAMING

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 BATTEN

Axon™ Panel fixings to Hardie™ CLD™ Structural Cavity Batten, as follows:

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 to 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.

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2.15 ADHESIVE FOR HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Adhesive to be applied continuous 6mm thick bead(s) to the face of Hardie™ CLD™ Structural 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 - generally

3.6 FIX WALL UNDERLAY

Refer to 4161 UNDERLAYS, FOIL AND DPC.

3.7 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 Technical Specification, Table 4: Hardie™ CLD™ Structural Cavity fixings. Refer to Table 6 for durability requirements of fixings.

3.8 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).

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Install Axon™ Panel cladding

3.9 PANEL LAYOUT

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

3.10 FASTENER - SIZE AND LAYOUT

Fix Axon™ Panels to framing using the fixings specified in James Hardie® Axon™ Panel technical 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.

3.11 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.

3.12 FIXING - AXON™ PANEL OVER HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

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.

3.13 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.

3.14 VERTICAL JOINT

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

3.15 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.

3.16 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 through Hardie™ CLD™ Structural Cavity Battens into framing, fixings 18mm minimum from square edge of sheet in accordance with James Hardie Axon™ Panel Technical Specification details.

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

Install Hardie™ CLD™ Structural Cavity Battens in accordance with James Hardie Axon™ Panel 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 Corner over battens, fixing in accordance with James Hardie Axon™ Panel Technical Specification details.

3.18 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.

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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.

3.19 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.

3.20 FINISHING

Refer to painting section/s for protective coating system.

Completion

3.21 REPLACE

Replace all damaged or marked elements.

3.22 LEAVE

Leave work to the standard required for following procedures.

3.23 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 batten
Thickness:	19mm
Fastener type:	65mm x 2.8mm RounDrive ring shank nails
Fastener finish:	Hot-dipped galvanized
Adhesive:	Sika Sikaflex 11FC

4.2 JAMES HARDIE AXON™ PANELS - SHEET CLADDING PANELS

Brand/type:	James Hardie Axon Panel Smooth 9mm
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™ 9mm Aluminium External Box corner

Finishing

4.3 PAINTING

Refer to painting section/s for details.

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4239JH JAMES HARDIE® SOFFITS

1 GENERAL

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

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

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For lining product and accessories

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.6 NO SUBSTITUTIONS

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 HARDIE™ FLEX EAVES LINING

James Hardie® Hardie™ Flex Eaves Lining 4.5mm and 6mm thick cellulose fibre reinforced cement sheet. Manufactured to AS/NZS 2908.2 from Portland cement, ground sand, cellulose fibre and water.

Components

2.2 FASTENER TYPE

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

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

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

Components - Hardie™ Flex Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIE™ FLEX NAILS

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

2.5 INSEAL TAPE

Inseal® 3259, 1.5mm thick x 48mm wide black compressible medium density closed cell foam tape.

2.6 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

Components - General

2.7 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

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3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber framing: 18% maximum

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

3.5 SHEET LAYOUT

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

3.6 CUTTING SOFFIT CLADDING

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

3.7 CIRCULAR HOLE FORMING

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

3.8 IRREGULAR HOLE FORMING

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

3.9 INSTALL HARDIE™ FLEX EAVES LINING

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

3.10 BUTT JOINT

Paint sheet edges prior to installation.

3.11 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.12 FASTENER - SIZE AND LAYOUT

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

3.13 SEALANTS

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

3.14 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.15 COMPLETION MATTERS

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



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4311ME METALCRAFT ESPAN ROOFING

1 GENERAL

This section relates to the supply and fixing of Metalcraft Roofing Ltd Espan® standing seam profiled roofing complete with accessories.

It includes:

- Espan® 340
- Espan® 470

1.1 RELATED WORK

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

1.2 ABBREVIATIONS

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

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

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

Documents

1.3 DOCUMENTS

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

BPS	Building Product Specifications
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water Supplies
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS 4256.3	Plastic roof and wall cladding materials, Glass fibre reinforced polyester
ISO 5660.1	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 1 Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction to fire tests - heat release, smoke production and mass loss rate. Part 2 Smoke production rate (dynamic measurement)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Metalcraft Roofing Espan® Product and Installation Guide (January 2023)
Metalcraft Roofing Building Product Information Sheet
COLORSTEEL® Maintenance Recommendations

Manufacturer/supplier contact details

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

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER - METALCRAFT ROOFING

Provide a material manufacturer/supplier warranty:

18 years	for failure of coating adhesion
50 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 install/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 trained and accredited by Metalcraft Roofing Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

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:

- COLORSTEEL® Maintenance Recommendations

Provide this information prior to practical completion.

Compliance information

1.10 COMPLIANCE - PROPOSED ALTERNATIVE SOLUTION

Metalcraft Roofing trough roofing profiles Espan® 340 and Espan® 470 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 550mm widths
- In-service history and previously accepted Alternative Solution for standing seam profiled roofing

Performance

1.11 DESIGN PARAMETERS WIND - NON SPECIFIC DESIGN

The design wind pressures are to NZS 3604, table 5.4.

Refer to general section 1220 PROJECT for details.

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1.12 DRINKING WATER

Roofing for collecting potable water to NZBC G12/AS1.

2 PRODUCTS

Materials

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

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

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 ESPAN FIXING CLIPS - UNPAINTED

Unpainted Zincalume® type AZ coated steel clip with corflute polypropylene cushioning tape. Refer to SELECTIONS.

2.4 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.

2.5 RIVETS

Sealed aluminium, minimum diameter 4.0mm.

Components

2.6 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0, Flashings.

Formable grade 0.55 BMT and 0.75 BMT for steel, and 0.90 BMT for aluminium. Flashings coated to the same standard as the roofing sheets and notched across profile ribs. Refer to SELECTIONS.

2.7 BOOT FLASHINGS

EPDM proprietary boot flashing designed to weatherproof cylindrical penetrations.

Accessories

2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

Neutral cure silicone or MS polymer sealant.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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



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3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber: 18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 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.

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. Add 4mm tolerance to cover width when setting out roofing sheets (i.e. 344mm for Espan® 340 or 474mm for Espan® 470). 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 permitted.

3.8 THERMAL MOVEMENT

Provide for thermal expansion to NZMRM CoP.

3.9 FIXING GENERALLY

Install and fix in accordance with 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 type AZ or type AM coated steel. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.11 FIX SHEETS - CONCEALED CLIP SYSTEM - TIMBER PURLINS

Screw fix concealed clip to purlins, minimum 35mm embedment, as required by Metalcraft Roofing, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet. Clip fit roofing sheets over concealed clip.

3.12 FIX SHEETS - CONCEALED CLIP SYSTEM - STEEL PURLINS

Screw fix concealed clip to purlins, minimum 3 threads beyond drill point, as required by Metalcraft Roofing, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet. Clip fit roofing sheets over concealed clip.

3.13 STOP ENDS AND DOWNTURNS

With purpose made tools, form minimum 30mm high stop-ends at the upper end of sheets. Fold 40mm hem along lower end of sheets and install grab flashing with a 5mm expansion gap in accordance with Metalcraft Roofing installation details.

3.14 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.

3.15 USE OF SEALANTS

Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces. Secure joint with rivets at 50mm centres.

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3.16 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.

Roof pitches 10° or greater:	Boot flashing is permitted to be direct fixed and sealed to Espan® sheet
Roof pitches less than 10°:	Boot flashing to be fixed and sealed over a soaker flashing

Completion & Commissioning

3.17 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

4.1 METALCRAFT ESPAN 340 TROUGH SECTION ROOFING - STEEL

Location:	All roofing to be replaced.
Manufacturer/supplier:	Metalcraft Roofing Ltd
Brand/type:	Espan® 340 - Flat pan
Dimensions:	Profile width 340mm, pan width 320mm, rib height 47mm
Roof pitch:	10° 0 40°
BMT/material:	0.55mm steel
Coating system:	COLORSTEEL® Maxam®
Coating colour:	client to select
Fixing clips:	Zincalume® fixing clip - unpainted
Purlin material:	timber
Clip fixing:	Class 4 10-12G galvanized wafer head screws

Accessories

4.2 FLASHINGS - GENERALLY

Profile:	refer to arch plans
BMT/material:	0.55mm steel
Coating system:	To match roofing
Paint colour:	To match roofing

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4383 TIMBER DECKING

1 GENERAL

This section relates to the fabrication and installation of exterior timber

- spaced boarding to decks
- steps and landings

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.2 DOCUMENTS

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

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

Performance - Slip resistance

1.3 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

Requirements

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

2.2 HARDWOOD SPACED BOARDING FOR EXTERIOR DECKS

Plantation-grown hardwood. Dressed four sides and with arrises, or specifically profiled decking.

3 EXECUTION

Conditions

3.1 GENERALLY

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

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.

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Application

3.2 FABRICATE AND INSTALL TIMBER STEPS

Fabricate and install steps and landings to comply with NZBC D1/AS1:4.0 Stairways, and unless detailed otherwise to BRANZ BU 497.

3.3 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.

3.4 SCREW FIXING

Pre-drill for all fixings, where the screws allow, use a proprietary deck pre-drilling and countersinking tool.

Use decking screws and power drive into the deck surface to just slightly below the board surface (approx. 0.5mm). Take care to not overdrive the screw as this may result in the screw heads or the boards being damaged. Refer to SELECTIONS.

3.5 CORROSION RISKS

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

Completion

3.6 LEAVE

Leave work to the standard required by following procedures.

3.7 REMOVE

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

4 SELECTIONS

4.1 EXTERIOR DECKING - HARDWOOD SPACED BOARDING

Species:	hardwood decking - contractor to select. confirm selection with client.
Size:	140mm x 19mm
Grooved face:	-
Finish:	contractor to select. confirm selection with client.

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4521 ALUMINIUM WINDOWS AND DOORS

1 GENERAL

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

- aluminium windows
- aluminium doors and frames
- hardware and furniture
- overhead glazing
- flashings

1.1 RELATED WORK

Refer to glazing sections for glass types

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ
PQAS	Powder Coating Quality Assurance System

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F4/AS1	Safety from falling
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.

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BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
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
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1
PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

US Federal Specification:

TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are not supplied.

Copies of the above literature are available from Altus

Web:	www.altus.co.nz

Warranties

1.5 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years: For fabrication

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

1.6 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

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

1.8 COMPLIANCE

Windows and doors to be manufactured and installed to NZBC E2/AS1.

1.9 CERTIFICATION

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

Performance

1.10 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:



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- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

1.11 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window manufacturer.

1.12 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.13 THERMAL PERFORMANCE - WINDOWS & DOORS

Thermal performance of windows & doors to NZBC H1/AS1 or NZBC H1/AS2 & NZBC H1/VM1 or NZBC H1/VM2. The construction R-value of windows & doors determined in accordance with NZBC H1/VM1 or NZBC H1/VM2, Appendix D, D1 Vertical windows and doors:

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

Refer to SELECTIONS for construction R-values.

Performance - Wind (design by contractor)

1.14 WIND - NON SPECIFIC DESIGN

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

Refer to SELECTIONS for wind zone.

Finishes

1.15 CERTIFY COATINGS - POWDER COATING

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

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

2 PRODUCTS

Materials

2.1 WINDOWS

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

2.3 ALUMINIUM EXTRUSIONS

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

2.4 ALUMINIUM SHEET AND STRIP

Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.

Alloy designation: 5251 - H16 or 5005 - H16

2.5 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

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2.6 GLASS

Refer to the glazing section for glass types and installation.

2.7 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 Windows and doors. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components - for cavity systems

2.9 STANDARD CAVITY CLOSER

A perforated device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with NZBC E2/AS1 to the spaces above the window or door.

2.10 SUPPORT BAR

WGANZ extruded aluminium support bar with built in drainage and ventilation to NZBC E2/AS1, to provide continuous support to the window unit. Size to suit cladding type.

Components

2.11 GLAZING GASKETS

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

2.12 HARDWARE AND FURNITURE

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

2.13 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, **Opening windows**.

Sealants

2.14 STRUCTURAL SEALANT

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

2.15 WEATHERING / INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT-S-001543A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

2.16 FOAM TAPE

Foam tape to NZBC E2/AS1, paragraph 9.1.9.9.

Finishes

2.17 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603



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3 EXECUTION

Conditions - generally

3.1 DO NOT DELIVER

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

3.2 UNLOAD WINDOW JOINERY

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

3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE

Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 636 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

3.7 ADDITIONAL PROTECTION

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

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS

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

3.9 INSTALLATION FIXING

To NZBC E2/AS1, paragraph 9.1.9.10. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings.

Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

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

3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces.

3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

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3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.

Installation - windows and doors

3.14 CORROSION PROTECTION

Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

3.15 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1, 9.1.4 Wall underlays to wall openings.
- Full height 20mm jamb battens to NZBC E2/AS1, Figure 9.1.9.4: General window and door opening for direct fixed (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

3.16 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

3.17 INSTALLATION CAVITY CONSTRUCTION

Install to WGANZ Window Installation Guide details and drawings including WGANZ sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to NZBC E2/AS1, Figure 8.5.6.1D: Junctions with walls for membrane.

3.18 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm minimum plus any jamb scriber width at each end.

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.



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3.22 PREPARE JOINTS

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

3.23 BACK UP

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

3.24 SEALANT FINISH

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

Completion - cleaning

3.25 REMOVE TRADE DEBRIS

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

3.26 TRADE CLEAN

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

Completion

3.27 PROTECTIVE COVERINGS

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

3.28 SAFETY

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

3.29 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM

In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted only to minor surface scratching. Otherwise replace all damaged material.

3.30 REMOVE

At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

3.31 REPLACE

Replace damaged, cracked or marked elements.

4 SELECTIONS

Performance - Wind (design by contractor)

4.1 WIND - NON SPECIFIC DESIGN

Building wind zone HIGH (refer to NZS 3604, table 5.4)

Window and door system

4.2 ALUMINIUM WINDOWS

Manufacturer: Altus
Type / location: Southern 41, Pacific 52 Thermal Recessed (Single window only - refer to details).

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4.3 ALUMINIUM DOORS

Manufacturer: Altus
Type / location: Southern 41

4.4 FLASHINGS

Material/type: 0.55 BMT
Pattern: Formed to suit details provided

Finishes - Powder Coating

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4554 SKYLIGHTS

1 GENERAL

This section relates to the manufacture, supply, and installation of sloped overhead skylights including:

- proprietary skylights fixed
- proprietary skylights opening
- moulded dome skylights
- tube skylights
- operating systems
- accessories including ventilation systems and lights.

1.1 RELATED WORK

Refer to 4521 ALUMINIUM WINDOWS & DOORS for all windows and doors

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
AS/NZS 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 4666	Insulating glass units
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)

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AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.
BRANZ BU 634	Finishing Aluminium

1.4 MANUFACTURER / SUPPLIER DOCUMENTS

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

Velux Skylight Catalogue
Velux Low Pitched Roof Fixed Skylight Technical Data Sheet
CodeMark Certificate

Copies of the above literature are available from Velux
Web: VELUX for professionals

Warranties

1.5 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years: For the supply of product as specified in SELECTIONS

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

10 years: For the installation of product as specified in SELECTIONS.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS

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

1.8 SELECTION OF GLASS

Selection of glass for sloped overhead glazing and insulated glass units to NZS 4223.4 and NZS 4223.2.

1.9 SAFETY GLAZING MATERIAL

To NZS 4223.3, and the relevant requirements of AS/NZS 2208. Ensure material is legibly marked and if cut by the distributor or installer mark each piece to NZS 4223.3.

Performance

1.10 THERMAL PERFORMANCE - SKYLIGHTS

Thermal performance of skylights to NZBC H1/AS1 or H1/AS2 & NZBC H1/VM1 or H1/VM2. The construction R-value of skylight determined by NZBC H1/VM1 or H1/VM2, Appendix D, D2 Skylights:

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

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Refer to SELECTIONS for Construction R-values.

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

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

2 PRODUCTS

2.1 SKYLIGHTS FIXED

Prefinished aluminium exterior frame with timber internal frame, fitted with toughened double glazing (IGU), complete with manufacturer's flashing kit.
Refer to SELECTIONS for type, finish and accessories.

Components

2.2 ALUMINIUM EXTRUSIONS

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

2.3 ALUMINIUM SHEET AND STRIP

Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.

Alloy designation: 5251 - H16 or 5005 - H16.

2.4 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.5 FIXINGS

Ensure all fixings and brackets are compatible with the skylight. Do not use electroplated zinc fasteners or brass fastenings.

2.6 GLAZING

IGU to AS/NZS 4666, NZS 4223.2 and NZS 4223.1

2.7 FLASHINGS GENERALLY

Material, grade and colour of flashings to be compatible with the roofing material. Use proprietary flashing kits where supplied by the manufacturer.

Accessories

2.8 SKYLIGHT HARDWARE

Fasteners, stays, locks, vents and other hardware as scheduled. Refer to SELECTIONS for type and finish. Where hardware is not scheduled, use hardware from manufacturer's standard range.

Finishes

2.9 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603.

2.10 TIMBER TREATMENT

Treated with water repellent coating, suitable for later finishing. Refer to 6721 PAINTING INTERIOR.

3 EXECUTION

Generally

3.1 CONFIRM

Confirm framed openings on site for dimensions, to suit the proprietary skylight.

3.2 EXECUTION GENERALLY

Check that the preparation of the opening is to NZBC E2/AS1, 8.1.7 Roof penetrations.

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3.3 HARDWARE GENERALLY

Factory fit all required and scheduled hardware.

3.4 HANDLING

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

3.5 RETAIN PROTECTIVE COVERINGS

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

Skylights

3.6 INSTALL SKYLIGHTS

Check that the trimmed openings are formed and constructed to suit the required units. Do not proceed until roof and structural openings are properly formed and weathertight roof flashings installed. Install and fix the skylight units strictly in accordance with the skylight manufacturer's requirements and installation instructions. Repack any thermal insulation around rough openings where disturbed by the installation. Install proprietary flashings and overflashings as detailed by the manufacturer to make the installation completely weatherproof.

3.7 SKYLIGHT ACCESSORIES AND OPERATING SYSTEMS

Install selected accessories and hardware and complete all operating systems.

Completion

3.8 CLEAN FRAMES AND GLAZING

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

3.9 CONFIRM

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

4 SELECTIONS

Performance

Skylights

4.1 SKYLIGHT FIXED

Accessories:

Accessories



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4610 GLAZING RESIDENTIAL

1 GENERAL

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

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 RELATED WORK

Refer to 4521 ALUMINIUM WINDOWS AND DOORS for aluminium joinery.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

Performance

1.5 THERMAL PERFORMANCE - EXTERNAL GLAZING

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

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

2 PRODUCTS

Materials

2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness to NZS 4223.1 and NZS 4223. Supp 1.

2.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

2.3 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.4 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas.
Refer to SELECTIONS.

2.5 REFLECTIVE AND COATED FLOAT GLASS

Either coated float glass incorporating both solar and thermal insulation properties; or coated float glass with only the thermal insulation properties.

2.6 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements.

Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Refer to SELECTIONS for specified surfaces of the IGU.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:
- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

Materials, mirrors

2.7 MIRROR GLASS

Clear annealed mirror float glass, including silver, activation, passivation and two protective coats.

Materials, screens

2.8 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, aluminium and uPVC glazing

2.9 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.

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2.10 SETTING BLOCKS

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

Components, wall mounted glass (mirrors and splashbacks)

2.11 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

2.12 GLASS MOUNTING CHANNELS

Refer to SELECTIONS/drawings for type and finish.

2.13 MIRROR DE-MISTER

Refer to appropriate eletrical section(s) for type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

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

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by NZS 4223.1, NZS 4223.3, NZS 4223.4 and NZS 4223. Supp 1. For windows tested to NZS 4211, ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading or human impact considerations govern.

3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to NZS 4223.1, Section 4 Glazing.

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

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

3.9 CONTAINMENT

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



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Assembly

3.10 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING

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

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

Application aluminium

3.15 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Application - wall mounted glass (mirrors and splashbacks)

3.16 WALL MOUNTED GLASS, SCREW FIXED

For mirrors and splashbacks, fix with proprietary zinc-plated steel countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.

3.17 WALL MOUNTED GLASS, CHANNEL MOUNTED

For mirrors and splashbacks,fix with proprietary mounting channels, to the channel manufacturer's requirements.

3.18 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.19 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

Finishing

3.20 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion

3.21 TRADE CLEAN

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

3.22 REPLACE

Replace damaged, cracked or marked glass.

3.23 LEAVE

Leave work to the standard required by following procedures.

3.24 REMOVE

Remove debris, unused materials and elements from the site.



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4710P PINK® BATTS® THERMAL & ACOUSTIC INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions® Pink® Batts® thermal and acoustic insulation materials for walls, floors, ceilings and roofs.

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting, wall underlays and roofing underlays.

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
IIC	Impact Insulation Class
STC	Sound Transmission Class

Documents

1.3 DOCUMENTS

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

NZBC G6/VM1	Airborne and impact sound
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/ New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Comfortech H1 Overview
Comfortech Pink® Batts® Insulation - Safety Data Sheet
Comfortech Pink® Batts® Thermal Solutions - Product Guide (May 2025)
Comfortech Pink® Batts® Ceiling Product & Insulation Guide (June 2025)
Comfortech Pink® Batts® Skillion Roof Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® Wall Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® SnugFloor® Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® BIB Product & Installation Guide (July 2025)
Comfortech Pink® Superbatts® Thermal Solutions - Installation Guide (Jan 2025)
Comfortech Pink® Batts® Silencer® Acoustic Installation Instructions
Comfortech Pink® Batts® Silencer® Wall & Midfloor Data Sheet
Comfortech Pink® Batts® Insulation Product Warranty
BRANZ Appraisal 238 (2023) - Pink® Batts® Insulation - Amended 23 February 2026
BRANZ Appraisal 632 (2023) - Pink® Batts® SnugFloor® Insulation - Amended 12 August 2024
BRANZ Appraisal 767 (2023) - Pink® Batts® Skillion Roof Insulation - Amended 21 January 2026

Manufacturer/supplier contact details

Company:	Tasman Insulation NZ Ltd
Trading as:	Comfortech Building Performance Solutions®
Web:	www.pinkbatts.co.nz
Telephone:	0800 746 522

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For Pink® Batts® insulation products

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year	For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 COMPLIANCE - BRANZ APPRAISAL 238

Pink® Batts® Insulation has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 238.

1.10 COMPLIANCE - BRANZ APPRAISAL 632

Pink® Batts® SnugFloor® Insulation has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 632.

1.11 COMPLIANCE - BRANZ APPRAISAL 767

Pink® Batts® Skillion Roof Insulation has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 767.

Performance

1.12 FIRE PROPERTIES - NON COMBUSTIBLE

Pink® Batts® insulation products are classified as non-combustible when tested to NZS/AS 1530.1 and achieve a Group Number of 1-S.

2 PRODUCTS

Materials - thermal insulation

2.1 PINK® BATTS® THERMAL INSULATION BATTS

Bio-soluble fibrous glass wool slabs manufactured from minimum 80% recycled window glass and bonded with thermosetting resin to AS/NZS 4859.1. Coloured Pink for identification. Available in a range of R-values, sizes and thicknesses. Refer to SELECTIONS.

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Components

2.2 WIRE NETTING

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

2.3 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape.

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 - general

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALL INSULATION - GENERALLY

Install insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to Pink® Batts® installation requirements and to NZS 4246 for all housing and buildings up to 300m². 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. Use insulation offcuts to fill small gaps between framing.

3.6 INSULATION CLEARANCES

Provide insulation clearances to NZS 4246 and for recessed luminaires AS/NZS 3000, 4.5.3.2. Where allowed by these standards provide insulation clearances to product manufacturer's stated clearances. Secure insulation in place so clearances are maintained and use guards/barriers , if required, where insulation is not secured.

3.7 LAY WIRE NETTING - UNDER JOISTS / PURLINS

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

3.8 LAY WIRE NETTING - OVER PURLINS

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

3.9 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

3.10 PREPARATION INSULATION

Before installation, gently agitate the insulation by shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Maintain the insulation in a dry state.

3.11 CUTTING INSULATION TO SIZE

Tear insulation by hand or cut with an insulation saw/knife, sharp scissors, or with sharp wide-blade knife. Cut slightly oversized for snug friction fit.

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Installation - thermal insulation

3.12 INSTALL PINK® BATTS® TIMBER WALL INSULATION

Friction fit insulation slabs between framing.

3.13 INSTALL PINK® BATTS® INTERIOR SECONDARY WALL INSULATION LAYER

Co-ordinate with the installation of battens to fit a secondary wall insulation layer. Friction fit insulation slabs between battens.

3.14 INSTALL PINK® BATTS® CEILING INSULATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.15 INSTALL PINK® SUPERBATTS® CEILING INSULATION - SINGLE LAYER INSTALLATION

Notch out the underside of the first slab to the same size as the truss cord. Friction fit slabs between truss framing with notch fit over truss bottom chord. Butt up adjacent slab under slight compression. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.16 INSTALL PINK® SUPERBATTS® CEILING INSULATION - DOUBLE LAYER INSTALLATION

Lay upper layer slabs over truss bottom chord perpendicular to chord. From underneath, friction fit the lower layer slabs between the truss bottom chords. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.17 PINK® BATTS® SKILLION ROOF INSULATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.18 INSTALL PINK® SUPERBATTS® SKILLION ROOF INSULATION - SINGLE LAYER INSTALLATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.19 INSTALL PINK® SUPERBATTS® SKILLION ROOF INSULATION - DOUBLE LAYER INSTALLATION

Friction fit upper layer of insulation slabs between framing. Install to the midpoint of the top plate. From underneath, friction fit the lower layer slabs between the ceiling battens. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.20 INSTALL PINK® BATTS® SNUGFLOOR® INSULATION

Friction fit insulation slabs between framing. Slabs to be 30mm wider than the distance between joist faces. Friction fit each piece between the joists. Fold on one side. Do not cover over wiring with insulation. Cut neatly around penetrations. Secure each slab with minimum 2 straps stapled to inside face of joist. Use two staples for each fixing point. Fold must not extend below bottom joist, trim if required.

Completion

3.21 COMPLETION MATTERS

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



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4855JG JURALCO GLASS BALUSTRADE SYSTEMS

1 GENERAL

This section relates to the fabrication, supply and installation of Juralco's range of frameless glass balustrade systems.

It includes:

- Balustrade glazing
- Balustrade mounting system
- Associated components to complete the installation

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PFC	Parallel flange channel
SS	Stainless steel

Documents

1.2 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZBC B2/AS1	Durability provisions for building elements
NZBC F2/AS1	Hazardous Building Materials
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
AS/NZS 2208	Safety glazing materials in buildings
NZS 4223.3	Glazing in buildings - Human impact safety requirements

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Juralco's Technical Manuals:

- Juralco Edgetec Mini Post Balustrade and Pool Fencing System - Issue 10-24 v1
- Juralco Edgetec Infinity Balustrade System - Issue 3-22 v1
- Juralco Edgetec JH Clamp Balustrade System - Issue 12-23 v1
- Juralco Edgetec Single Disc Anchor Balustrade System - Issue 5-24 v2
- Juralco Edgetec Double Disc Anchor Balustrade System - Issue 7-24 v1
- Juralco Edgetec Matador® Mini Post Balustrade System - Issue 9-23 v1
- Juralco Edgetec PosiGlaze Balustrade System - Issue 11-23 v1
- Juralco Edgetec MegaGrip Balustrade System - Issue 7-24v1
- Juralco Interlinking Rail Systems - Issue 1-24 v1
- Juralco's BPIR documentation for Edgetec Balustrade Systems

Manufacturer/supplier contact details

Company:	Juralco Aluminium Building Products Ltd
Web:	www.juralco.co.nz
Email:	specify@juralco.co.nz
Telephone:	09 478 8018

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For Juralco Edgetec frameless glass balustrade systems

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Powder coat warranty as offered by the powder coat system supplier.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For installation of Juralco 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

1.6 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved by manufacturer / supplier. If requested provide evidence of qualification / experience prior to commencing work. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.8 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the powder coating care, glass care, stainless steel care and maintenance information as electronic PDF format documents.

Provide this information prior to practical completion.

Compliance information

1.10 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.

Performance - Wind

1.11 DESIGN PARAMETERS WIND

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

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Quality control and assurance

2 PRODUCTS

Balustrade system

2.1 JURALCO EDGETEC GLASS BALUSTRADE SYSTEM

To NZBC B1/VM1, NZBC B2/AS1, NZBC F2/AS1, NZBC F4/AS1, NZBC F9/AS1, NZS 4223.3. Juralco Edgetec Glass Balustrade System comprises frameless glazing secured by proprietary mounting clamps/anchors. Completed with top rails, handrails, stiffener brackets where required or selected. Refer to SELECTIONS.

Balustrade mounting

2.2 JURALCO EDGETEC DOUBLE DISC ANCHOR

Double disc anchors, supplied as a kit, comprising 50mm∅ two-part disc anchors, 50mm∅ x 0.8mm black nylon gaskets, nylon bushes and fasteners required for the anchor assembly. Disc anchors are supplied in polished or satin finished 316 marine grade stainless steel or powder coated 6060 T5 grade aluminium extrusion. Powder coated aluminium square two-part cover kit, EPDM washer and 50mm∅ x 6mm spacer available. Refer to SELECTIONS.

Balustrade glazing

2.3 SENTRYGLAS GLASS

Toughened laminated Grade A Safety glass to AS/NZS 2208 made from layers of SentryGlas glass bonded with SentryGlas ionoplast interlayers.

Components

2.4 STIFFENER BRACKET

Duplex 2205 stainless steel stiffener bracket available in polished, satin or powder coat finish and a range of sizes and shapes. Refer to SELECTIONS.

2.5 CONSTRUCTION SEALANT

Bostik Rhodorsil V60 one component neutral cure, high modulus, clear silicone construction sealant.

2.6 SCREW ADHESIVE

Sika Supergrip no shrinkage, waterproof, transparent polyurethane paste construction adhesive for bonding coachscrews / lagscrews.

2.7 THREADLOCK ADHESIVE

Acrylic one compound adhesive for securing threaded fasteners from loosening due to shock and vibration.

2.8 FIXINGS

Refer to SELECTIONS. Stainless steel fixings to be of type 316.

Finishes

2.9 FINISHES

Dulux polyester powder coating for aluminium, satin or polished finish for stainless steel. 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 GLAZING SUPPLY

Organise for the supply of glazing by nominated glazing supplier. Refer to SELECTIONS.

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3.3 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.4 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 DRILL FIXING HOLES

Mark out clamp/anchor and fixing locations and drill fixing holes to diameter and depth required by Juralco's Technical Manuals for the specified fastener type.

3.7 APPLY SEALANT/ADHESIVE

Apply sealant/adhesive where required by Juralco's Technical Manuals, apply to the sealant/adhesive manufacturer's instructions.

3.8 INSTALL CLAMPS/ANCHORS

Assemble and install clamps/anchors to Juralco's Technical Manuals. Install plumb, level and true to line and face.

3.9 INSTALL STIFFENER BRACKETS

Install stiffener brackets to glass panels to Juralco's Technical Manuals. Install stiffener brackets 200mm maximum from glass panel top edge.

3.10 INSTALL GLASS

Install glass panels to Juralco's Technical Manuals plumb, level and true to line. Ensure secure fit of glass panels to clamps/anchors.

Completion

3.11 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 GLAZING SUPPLIER

Company:	Contractor to select
Contact:	-
Email:	-
Telephone:	-
Installation:	By -

Juralco Edgetec Double Disc Anchor balustrade system

4.2 JURALCO EDGETEC DOUBLE DISC ANCHOR BALUSTRADE

Location:	South Elevation to media room and master bedroom
Supplier:	Juralco Aluminium Building Products Ltd
Brand/type:	Juralco Balustrade System
System:	Edgetec Double Disc Anchor
Glass type:	13.52mm SentryGlas
Glass strength:	Minimum 100Mpa
Glass edges:	Polished
Anchor kit:	Hidden screw fix

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4.3 DOUBLE DISC ANCHOR FIXINGS - TIMBER JOIST

Structure:	Timber joist / min. s/240mmX45
Fixing method:	Face fix
Fastener:	M10 SS threaded rod A4-70
Washer:	50mm square x 3mm SS washer
Nut:	M10 SS

Components

4.4 JURALCO STIFFENER BRACKET

Location:	Refer to South Elevation
Supplier:	Juralco Aluminium Building Products Ltd
Brand/type:	Juralco Stiffener Brackets



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5113 PLASTERBOARD LININGS

1 GENERAL

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

- standard systems
- superior finish quality systems
- wet area systems
- bracing systems
- minor related fire rating
- minor related sound rating

1.1 ABBREVIATIONS

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

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

BPS	Building Product Specifications
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3602	Timber and wood based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	Cold-formed steel structures
ASTM C630/C630M-96a	Water-resistant gypsum backing board
BRANZ Technical Paper P21	Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH Standard Part 2: Light steel framed buildings	

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

Requirements

1.3 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications. Plasterboard fixers and stoppers to be experienced competent workers, familiar with materials and techniques specified. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.4 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:

- before applying sealer and
- before applying finish coatings or decorative papers,

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

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Performance - systems

1.5 BRACING REQUIREMENTS

Provide braced wall systems using bracing rated plasterboard sheet to meet the requirements of NZS 3604, section 5, **Bracing design**, when tested in accordance with BRANZ Technical Paper P21.

2 PRODUCTS

Materials

2.1 GYPSUM PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use to AS/NZS 2588.

2.2 GYPSUM PLASTERBOARD, HIGH FINISH SYSTEMS

Gypsum plaster core encased in a special fine surface durable face and backing paper formed for standard and fire rated use to AS/NZS 2588.

2.3 GYPSUM PLASTERBOARD, WATER RESISTANT SYSTEMS

Gypsum plaster core containing a wax emulsion encased in a durable face and backing paper formed for standard and fire rated use to AS/NZS 2588 and for water resistance use to ASTM C630/C630M-96a.

2.4 GYPSUM PLASTERBOARD, WALL BRACING SYSTEMS

Gypsum plaster core encased in a durable face and backing paper bracing rated sheet to AS/NZS 2588.

2.5 CORNICE

Plasterboard, scotia pattern.

Components

2.6 CEILING BATTENS, METAL

0.55mm galvanized steel (275 g/m² zinc coating) battens and matching perimeter channels.

2.7 SCREWS, TIMBER FRAME

10mm plasterboard: Type S gypsum screws 25mm x 6 gauge
13mm plasterboard: Type S gypsum screws 32mm x 6 gauge

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.8 NAILS, TIMBER FRAME

10mm plasterboard: 30mm x 2.5mm galvanized drywall clouts
13mm plasterboard: 40mm x 2.5mm galvanized drywall clouts

Nails for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.
Nails for perimeter nailing for bracing systems complete with 15mm galvanized steel washers as required by the sheet manufacturer's approved specification.

2.9 SCREWS, STEEL FRAME / BATTENS

10mm plasterboard: Type S gypsum screws 25mm x 6 gauge
13mm plasterboard: Type S gypsum screws 32mm x 6 gauge

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.10 SECTIONS AND TRIM MATERIAL

Form from galvanized steel of a coating class not less than ZM275 to AS 1397 and fix with 30mm x 2.5mm galvanized clouts.

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2.11 EXTERNAL ANGLE
Perforated.

2.12 INTERNAL REINFORCING ANGLE
Perforated.

2.13 CONTROL JOINT
With plastic protective tape.

2.14 CASING BEAD
To suit sheet thickness.

2.15 J MOULD
Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25mm x 1.6mm nickel panel pins.

2.16 TAPE ON EDGE TRIMS
Tape-on paper tape and galvanized steel trims and edges.

2.17 EDGE PROFILES
Pre-formed aluminium profiles, with perforated edge trims.

Accessories

2.18 ADHESIVE
Multi-purpose water based wallboard adhesive.

2.19 JOINTING COMPOUNDS
System match bedding compound and finishing compound. Refer to the sheet manufacturer's literature and follow their requirements on which compounds to use with which accessory and in which location, to achieve the required level of finish.

2.20 JOINTING TAPE
System match reinforcing tape.

Finishes

2.21 SKIMCOAT PLASTER
Proprietary spray-on surface finish.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work. Do not commence work until the substrate is plumb, level and to the standard required by AS/NZS 2589 and the sheet manufacturer's requirements.

Do not begin installation until the building is closed in, fully glazed, the roof watertight and the atmospheric conditions within the plasterboard manufacturer guidelines.

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3.4 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

Ensure that the timber framing to which plasterboard lining is fixed, shall comply with NZS 3602, NZS 3603 & NZS 3604. Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials.

Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1, 10.0 Construction Moisture.

3.5 LEVELS OF PLASTERBOARD FINISH

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

3.6 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

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

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

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

3.7 PROTECTION

Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.8 GENERAL REQUIREMENTS

Leave a 10mm gap at floor level. Do not break the face paper. Position sheets to a "touch fit" with no forcing or springing into place. Run sheets over doors and under and over window openings. Apply adhesive in daubs 25mm diameter and 10mm thick. Do not place daubs at sheet perimeters or under nail and screw fixings.

Application - general

3.9 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.10 INSTALL CEILING BATTENS

Install in accordance with the batten manufacturer's requirements.

3.11 LINE CEILINGS AND WALLS

Line ceilings and walls with the various sheets and fix to the sheet manufacturer's details and requirements, using tapered edge joints as far as possible.

3.12 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.13 END BUTT JOINTS

When end butt joints are unavoidable, locate staggered off the framing, back block, fix and stop to the sheet manufacturer's details and requirements.

Application - bracing systems

3.14 LINE BRACING WALLS

Line walls with high density plasterboard sheet to form panels or systems, clout-washer and clout fixed to the sheet manufacturer's details. Do not fix bracing sheets until steel bracing and/or straps are in place.

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Application - wet area systems

3.15 LINE WET AREA WALLS

Line walls in accordance with the sheet manufacturer's requirements.

Application - finishing sections and trim

3.16 FIX EXTERNAL ANGLE

Fix full length to external corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.17 FIX INTERNAL REINFORCING ANGLE

Fix full length to internal corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.18 FIX CASING BEAD

Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.

3.19 FIX J MOULD

Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.

3.20 FORM CONTROL JOINTS

Provide at maximum 9 metre centres in long unbroken walls and 12 metre centres to ceilings to the sheet manufacturer's details and requirements. Fix control joint section into joint by staples at 150mm both sides. Fill gap in voids with sound rated sealant. Remove plastic tape after stopping.

3.21 FIX COVER MOULDS

Fix to the sheet manufacturer's details and requirements and to the drawings supplied.

3.22 FIX CORNICE

Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements

3.23 FORM SQUARE STOPPED CORNERS

Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.

3.24 INSTALL TAPE-ON TRIMS

Install in accordance with the trim manufacturer's requirements.

3.25 INSTALL SPECIAL EDGES AND BANDS

Install in accordance with the edging manufacturer's requirements.

Finishing - stopping

3.26 FORM JOINTS

Fill recess with bedding compound, centre the reinforcing tape, apply a second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off, to the sheet manufacturer's details and requirements.

3.27 STOPPING NAILS AND SCREWS

Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.

3.28 SQUARE STOPPED CORNERS

Fill with bedding compound, centre reinforcing tape into internal angle and apply a coat of finishing compound and complete to the sheet manufacturer's details and requirements.

3.29 EXTERNAL ANGLES

Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.



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3.30 END BUTT JOINTS

Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

3.31 APPLYING SKIMCOAT PLASTER

Apply spray-on surface finish in accordance with the sheet manufacturer's requirements.

Completion & Commissioning

3.32 COMPLETION MATTERS

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

4 SELECTIONS

4.1 PLASTERBOARD LININGS - STANDARD SYSTEMS - WALLS

Location:	All walls not in wet areas or otherwise notated as having ply linings
Type/thickness:	10mm
Finish:	Level 5

4.2 PLASTERBOARD LININGS - STANDARD SYSTEMS - CEILINGS

Location:	All ceilings not in wet rooms or otherwise notated as having ply linings
Type/thickness:	13mm
Finish:	Level 5

4.3 PLASTERBOARD LININGS - BRACING SYSTEMS

For bracing element location refer to drawn documentation.

Accessories

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5120 LININGS

1 GENERAL

This section relates to the supply and installation of internal wall and ceiling linings, and all associated accessories and trim except for plasterboard.

1.1 RELATED WORK

Use 5113 PLASTERBOARD LININGS for projects where only plasterboard is used.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 1859.2	Reconstituted wood-based panels - Specifications - Dry processed fibreboard
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 - Specification
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Profiles of mouldings and joinery
New Zealand Fibrous Plaster Association:	Code of recommended practice for the application and fixing of fibrous plaster
BRANZ BU 519	Fasteners selection

2 PRODUCTS

Sundry linings and finishings

2.1 STRUCTURAL PLYWOOD

To AS/NZS 2269.0 for bracing use.

2.2 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ BU 519 Fasteners selection.

2.3 SCREWS FOR POWER SCREW GUN DRIVING

Timber framing:	3.5mm x 30mm with self embedding head
Steel framing:	3.5mm x 30mm with self embedding head

2.4 TIMBER INTERIOR FINISHING TRIM

Selection to NZS 3602. Profile as detailed, or if not shown, to NZS 3610.

2.5 PVC JOINTERS

Profiles to suit location and sheet thickness.

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2.6 METAL JOINTERS

Profiles to suit location and sheet 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

To NZS 3604, sections 8, 10, 12, 13 and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels. Starting work implies acceptance the substrate will allow work of the required standard.

3.4 MOISTURE CONTENT

Maximum allowable moisture content in accordance with NZS 3602 for:

Framing at lining:	20% for timber-based linings
Framing at lining:	16% for fibrous plaster linings

3.5 PROTECT

Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.6 TIMING OF WORK

Ensure building is weatherproof before lining work commences.

3.7 CONFIRM LEVELS OF FINISH

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained.

Sundry items

3.8 PROPRIETARY ACCESS HATCH

Install and fix to the hatch manufacturer's requirements.

3.9 CEILING ACCESS

Trim out ceiling to form 600mm x 500mm square clear opening. Fit finished 40mm x 12mm timber facings to perimeter, set to support a lift-out panel of the ceiling material.

3.10 TRIM

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber bead cornices as detailed and shown.

Completion & Commissioning

3.11 COMPLETION MATTERS

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



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4 SELECTIONS

Sundry linings and finishings

4.1 INTERIOR PLYWOOD

Brand/type:	PlyMasters Rapidline Pine UT
Thickness:	12mm (min.) 18mm preferred - confirm with owner.
Grade:	CD

Accessories

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5230 INTERIOR DOORS

1 GENERAL

This section relates to the supply and installation of interior doors.

1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

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

1.3 DOCUMENTS

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

NZS 3602	Timber and wood-based products for use in building
NZS 3610	Specification form profiles of mouldings and joinery

2 PRODUCTS

2.1 TIMBER

To NZS 3602.

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to NZS 3610. Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

2.3 DOORS, PAINTED

Doors as scheduled (without clashing strips).

2.4 CAVITY SLIDERS

Doors hung within a proprietary cavity slider frame and complete with brand-matched sliding door gear.

2.5 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

2.6 SLIDING DOOR GEAR

To suit door/sash size and glazed weight and as detailed.

3 EXECUTION

3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

3.2 EXECUTION GENERALLY

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

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -

- Hinges

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3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

Internal doors

3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

3.6 DOOR FRAMES, SOLID REBATED

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.7 DOOR LINERS

Heads and jambs finished minimum 18mm, with 10mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.8 DOOR LINERS, EXTENDED

Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.9 CAVITY SLIDERS

Install in accordance with the door manufacturer's requirements, allowing for removal of top trim for maintenance.

Completion

3.10 CHECK

Check and adjust operation of all sashes, doors, hardware and furniture.

3.11 TEMPORARY PROTECTION

On completion remove any temporary protection and leave ready for following work.



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6122A ARDEX FLOOR SUBSTRATE PREPARATION

1 GENERAL

This section relates to preparing for and carrying out floor levelling work over a range of substrates, prior to the installation of floor coverings.

1.1 RELATED WORK

Refer to 4131 BITUTHEN AND PREPRUFE MEMBRANE TANKING SYSTEM for tanking to foundation and retaining walls.

Documents

1.2 DOCUMENTS

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

NZS AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices
NZS 3114	Specification for concrete surface finishes

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

1.3 MANUFACTURER'S DOCUMENTS

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

ARDEX floor levelling compounds manual

Copies of the above literature are available from ARDEX:

Web:	www.ardexnz.com
Email:	info@ardexnz.com
Telephone:	0800 2 ARDEX (27339)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

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

Warranty period:	10 years
Form of warranty:	ARDEX standard form

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

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified ARDEX materials, or associated products.

1.6 QUALIFICATIONS

Applicators to be experienced in the application of floor levelling compounds. Application to be strictly in accordance with ARDEX technical literature.

1.7 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.

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2 PRODUCTS

Materials -Primers and Admixes

2.1 ARDEX P 51 PRIMER

P 51 is a water-based primer, precoat, bonding agent and pore closer for concrete substrates. As a pore closer Ardex P51 prevents air bubbles rising from substrates and creating defects in the underlays.

2.2 ARDEX E 25 RESILIENT EMULSION / MORTAR ADMIX

Synthetic resin admixture. Ardex E 25 is a liquid admixture designed to enhance tensile strength, improve surface toughness, and increase flexibility of selected Ardex mortars and floor levelling compounds.

Materials - Levelling Compound

2.3 ARDEX K 15 MICROTEC COMMERCIAL LEVELLING COMPOUND

Ardex K 15 Microtec is extremely versatile and is suitable for a wide range of substrates. Ardex K 15 Microtec is able to receive virtually any floor covering in 16 to 18 hours. Dry internal use only.

2.4 ARDITEX K 60 FLEXIBLE LEVELLING COMPOUND

ARDITEX K 60 is formulated with excellent adhesion designed to work under a damp proof membrane. Also used to pre-level existing timber floors prior to the installation of sheeting for a stable base for new floor coverings. Internal and external applications.

2.5 ARDEX K 65 LEVELLING COMPOUND

ARDEX K 65 is a single part reinforced smoothing and levelling compound for timber floors.

3 EXECUTION

Conditions

3.1 COMPLY

Comply with all Ardex requirements and instructions.

3.2 STORE

Store materials under conditions that ensure no deterioration or damage.

3.3 CHECK SUBSTRATE

Check that the substrate will allow work of the required standard. Complete any remedial work identified before commencing any floor levelling work.

Application - substrate preparation

3.4 PREPARATION - GENERAL

Ensure that all surfaces are sound, clean and free of oil, grease, wax dirt, asphalt, curing compounds, latex and gypsum compounds, dust, paint, or any contaminants which might act as a bond breaker. Carry out moisture test and PH test in accordance with NZS AS 1884. Refer to the Ardex floor levelling compounds manual for specific and detailed instructions for various substrates and their condition.

3.5 PREPARE TIMBER SUBSTRATE

Sand, using a course abrasive, to remove all foreign matter and any existing protective coatings to provide a clean, mechanical surface. Vacuum all dust and debris. Do not use solvents, strippers, or cleaners to remove contamination.

Application - general

3.6 PRIMING

Prepare for and apply Ardex primer strictly in accordance with Ardex's requirements and instructions.

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3.7 FLOOR LEVELLING

Prepare materials and carry out floor levelling strictly in accordance with Ardex requirements and instructions.

Completion

3.8 REMOVE

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

3.9 PROTECT

Protect completed work from damage for the period between completion of the floor levelling work and completion of flooring.



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6221A ARDEX FLOOR TILING SOLUTIONS

1 GENERAL

This section relates to the supply and installation of ARDEX New Zealand internal and external floor tiling systems.

It includes:

- Acoustic underlays
- Levelling screeds
- Primers
- Waterproofing systems
- Adhesives
- Sealants
- Grouts

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:

CFC	Compressed fibre cement
PVC	Polyvinyl chloride
WMAI	Waterproofing Membrane Association (NZ) Incorporated
WPM	Waterproofing membrane

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
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC G3/AS1	Food preparation and prevention of contamination
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
ISO 13007.1	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for adhesives
ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
NZS 4121	Design for access and mobility - Buildings and associated facilities
WMAI CoP	Code of Practice for Internal Wet Area Membrane Systems
Codemark™ CMNZ70189 ver0	Ardex WPM 715 and WPM 1000

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

ARDEX Tiling and Substrate Preparation Systems (October 2023)
ARDEX Product Technical Data Sheets
ARDEX Technical Tiling Systems Bulletins
ARDEX Product Building Product Information Sheets
ARDEX Tiling General Care information sheet
BRANZ Appraisal 472 (2022) - ARDEX Undertile Internal Liquid Waterproofing Membranes - Amended 24 May 2024
BRANZ Appraisal 473 (2022) - ARDEX Undertile External Liquid Waterproofing Membranes - Amended 24 May 2024
BRANZ Appraisal 727 (2023) - ARDEX Undertile Sheet Membrane (WPM 750 and WPM 1000)

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BRANZ Appraisal 925 (2024) - ARDEX WPM 1000 External Deck Membrane

Manufacturer/supplier contact details
Company: ARDEX New Zealand Ltd
Web: www.ardex.co.nz
Email: info@ardexnz.com
Telephone: 0800 227339

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS WORKERS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Waterproofing applicators to be trained by ARDEX New Zealand. Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

- ARDEX Tiling General Care

Provide this information prior to practical completion.

Compliance information

1.10 COMPLIANCE - BRANZ APPRAISAL 472

ARDEX Undertile Internal Liquid Waterproofing Membrane has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 472.

1.11 COMPLIANCE - BRANZ APPRAISAL 727

ARDEX Undertile Sheet Membrane (WPM 750 and WPM 1000) has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 727.

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Performance - Slip resistance

1.12 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 - levelling screeds

2.1 ARDEX LQ 92
Cement-based, polymer modified, self-smoothing levelling compound.

2.2 ARDEX K 60
Two part, self-levelling latex compound.

2.3 ARDEX K 301
Cement-based levelling compound.

2.4 ARDEX A 46
Rapid setting and drying, slump free cement-based mortar.

2.5 ARDEX K 65
One part, fibre reinforced, polymer modified levelling compound.

2.6 ARDEX K 900 BF
Cement-based levelling compound.

2.7 ARDEX A 38 SCREED
Rapid-set, cement screed for use with ARDEX Gravel Mix and Engineered Sand aggregate.

2.8 ARDEX A 48 SCREED
Premixed, rapid-set, cement and aggregate screed.

Materials - substrate preparation

2.9 ARDEX MULTIPRIME
One part, water-based primer for porous substrates.

2.10 ARDEX P 9
One part, water-based primer for non-porous substrates.

2.11 ARDEX P 51
One part water-based, primer, pre-coat, and bonding agent for porous substrates.

2.12 ARDEX WPM 300 MOISTURE BARRIER
Two-component, water-based, epoxy polyamide membrane/barrier hydrostatic pressure resistant coating.

Materials - waterproofing

2.13 ARDEX WPM 002
Two component, fibre reinforced, acrylic polymer, liquid waterproofing membrane.

2.14 ARDEX WPM 155 RAPID
One component, polyurethane-acrylic, fast drying, liquid waterproofing membrane.

2.15 ARDEX WPM 750
Fleece-lined, synthetic rubber sheet membrane, 0.75mm thick, 1.4m wide x 20m long rolls.

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Materials - adhesives

2.16 ARDEX X 17

Flexible, polymer modified, cement-based adhesive, formulated with non-slumping mastic type properties. Classified C2TES1 to ISO 13007.1.

2.17 ARDEX X 18

Flexible, polymer fortified, fibre reinforced, cement-based adhesive, formulated with non-slumping mastic type properties. Classified C2TES1 to ISO 13007.1

2.18 ARDEX X 32

Flexible, polymer fortified, cement-based adhesive, formulated with non-slumping mastic type properties. Suitable for moisture sensitive stone. Classified C2TES1 to ISO 13007.1.

2.19 ARDEX X 56

Highly-flexible and fast setting polymer modified adhesive. Classified C1ES2 to ISO 13007.1.

2.20 ARDEX X 77

Fibre reinforced, polymer modified adhesive. Classified C2FTES1 to ISO 13007.1.

2.21 ARDEX OPTIMA

Highly-flexible, two part adhesive with high initial grab qualities. Classified C2TS2 to ISO 13007.1.

Materials - grouts

2.22 ARDEX FG 8

Fine sanded, cement-based standard grout for joints 1mm to 8mm wide. Classified CG2W to ISO 13007.3.

2.23 ARDEX FS-DD

Non-sanded, cement-based grout for joints 1mm to 4mm wide. Classified CG1 to ISO 13007.3.

2.24 ARDEX EG 15

Three part stain and chemical resistant epoxy grout for joints 1.5mm to 15mm wide. Classified RG to ISO 13007.3.

Materials - additives

2.25 ARDEX ABALASTIC

Liquid polymer additive for use with cement-based adhesive to improve adhesion, water resistance and flexibility.

2.26 ARDEX GROUT BOOSTER

Water-based, synthetic polymer grout additive for use with cement-based grouts to improve adhesion strength, flexibility and abrasion resistance.

Undertile heating

2.27 UNDERTILE HEATING

Refer to appropriate underfloor heating section for electric heating systems under tiles.

Components

2.28 ARDEX ST TAPE

Uncured, self-adhesive butyl tape, fleece lined one side.

2.29 ARDEX CA 750 CONTACT ADHESIVE

Water-based contact adhesive.

2.30 TRIMS

Tile trim, edge strips, floor finish divider strips and weather bars. Available in aluminium, brass and stainless steel. Refer to SELECTIONS.



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2.31 MOVEMENT JOINT - SEALANT

One part, flexible acetic or neutral cure silicone sealant. Refer to SELECTIONS.

2.32 MOVEMENT JOINT - BACKING ROD

Polyethylene foam (PEF) backing rod. 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 concrete:	75% maximum relative humidity, minimum 28 day cured
Moisture content plywood:	18% maximum
Moisture content particleboard:	16% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 APPLICATION GENERALLY

To AS 3958.1, ARDEX New Zealand Ltd instructions, and to WMAI CoP recommendations. Surfaces to be clean, sound and free of dust, oil, grease, curing compounds or release agents.

3.6 APPLY LEVELLING SCREED

Mix levelling screed to ARDEX instructions. Trowel onto prepared substrate to required thickness and fall, where required:

1:40 minimum	deck acting as a roof to NZBC E2/AS1
1:40 minimum	accessible showers to NZBC G1/AS1
1:50 minimum	shower bases to NZBC E3/AS1
1:50 minimum	shower bases for people with disabilities to NZS 4121
1:50 minimum	food processing areas (e.g. commercial kitchens) to G3/AS1
1:50 maximum	cross fall for outdoor accessways in public areas to NZS 4121

3.7 APPLY ARDEX WPM 300 MOISTURE BARRIER

Spray fine mist of water over substrate. Spread barrier evenly over entire substrate with a stiff nylon broom. Apply second coat with a long nap roller.

3.8 APPLY PRIMER

Sponge, brush or roll primer liberally over entire substrate.

3.9 APPLY ARDEX LIQUID WPM

Reinforce corners and penetrations with ARDEX ST TAPE. Mix waterproofing components to ARDEX instructions. Brush or roll on liquid waterproofing membrane over prepared substrate. Apply two coats to achieve required minimum total dry film thickness to ARDEX product technical data sheet.

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3.10 APPLY ARDEX SHEET WPM

Lay sheet membrane allowing for 50mm overlap with adjacent sheet. Working in rows lengthwise, fold back half of the width of the membrane sheet. Brush ARDEX contact adhesive to substrate and underside of membrane, avoiding the 50mm overlap. Unfold the membrane and press onto the substrate. Heat weld the 50mm overlapped membranes together.

3.11 INSTALL UNDERTILE HEATING

Refer to appropriate underfloor heating section for electric heating system under tiles.

3.12 SETTING OUT

Confirm tile layout and bond pattern. Cut tiles to tile manufacturer's recommendations. Lay tiles level, maintaining falls to drainage where required (e.g. floor wastes). Provide joint widths to the tile manufacturer's recommendations.

3.13 MOVEMENT JOINTS GENERAL

Provide movement joints to AS 3958.1:

Depth:	Movement joints to go right through the tile and bed to the background.
Width:	6mm
Locations:	At walls, columns, nibs, hobs and similar. Around sanitary fixtures. Around fixtures interrupting the tile surface (e.g. at junctions with joinery fixtures, window/door frames, and built in cupboards). At changes in substrate.
Large areas:	Provide joints at not less than 4.5 metres spacing in both directions for internal floors. Provide joints at not less than 3.5 metres spacing in both directions for external floors. Provide joints over existing joints in the substrate.

3.14 ADHESIVE APPLICATION GENERAL

For general floor tiling, use a 10mm x 10mm x 10mm notched trowel.

For large format tiles, use a 12mm x 12mm x 12mm notched trowel.
For mosaics, use a 4.5mm x 4.5mm x 4.5mm notched trowel.
Remove a tile periodically during installation to check for correct adhesive coverage. Do not fix tiles over skinned adhesive.

3.15 APPLY ADHESIVE

Mix adhesive to ARDEX instructions. Spread adhesive over prepared surface with a notched trowel to ARDEX recommended bed thickness.

3.16 INSTALL TRIM

Press trim into wet adhesive.

3.17 LAY TILES

Firmly press tiles into the adhesive bed for full contact between tile and adhesive with no voids. Butter the back of tiles with ribbed or keyed underside before laying into adhesive bed by spreading a thin layer of adhesive on the back of the tile. Remove surplus adhesive from tile surfaces before adhesive sets.

3.18 APPLY GROUT

Mix grout to ARDEX instructions. Work grout into joints with a rubber trowel. Allow the grout to firm up in the joint before wiping tile surface with a damp, dense sponge.

3.19 INSTALL MOVEMENT JOINT BACKING ROD

Place PEF backing rod into movement gaps. Apply a continuous bead of silicone sealant over PEF backing rod.

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Completion & Commissioning

3.20 COMPLETION MATTERS

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

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

Requirements

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.6 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to WorkSafe: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

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1.7 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

1.8 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

1.9 MANUFACTURER'S INSPECTION

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.10 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 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

3.2 CORROSION PROTECTION SUPERVISION FOR STRUCTURAL STEEL

To AS/NZS 5131, 9.9.20, for corrosion protection of structural steel. Provide an Inspection and Test Plan (ITP) to AS/NZS 5131, 13.9.1, prior to commencement.

Corrosion protection painting to be supervised by a competent person.

3.3 PREPARE

Prepare surfaces to the coating manufacturer's requirements.



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3.4 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.5 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.6 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.7 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.8 TREATED SURFACES

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

3.9 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior
For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.
Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior
For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.
Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.10 ANCILLARY SURFACES

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

3.11 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.12 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products

3.13 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.14 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

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3.15 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.16 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.17 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.18 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.19 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.20 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - gypsum plaster

3.21 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - painted surfaces generally

3.22 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.

3.23 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.

3.24 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

3.25 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.



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3.26 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.

3.27 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.28 CONCEALED METAL SURFACES

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

3.29 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.30 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.

3.31 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

3.32 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.33 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.34 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

3.35 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.36 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.

3.37 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.

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3.38 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.

3.39 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.40 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

3.41 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.

3.42 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.

3.43 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.

3.44 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.

3.45 REPLACE HARDWARE

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

4 SELECTIONS

4.1 SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.



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6711 PAINTING EXTERIOR

1 GENERAL

This section relates to the preparation of exterior unpainted and pre-painted surfaces, and the application of exterior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

Warranties

1.2 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.

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6721 PAINTING INTERIOR

1 GENERAL

This section relates to the preparation of interior unpainted and pre-painted surfaces, and the application of interior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
BPS	Building Product Specifications

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.

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7120 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC G4/AS1	Ventilation of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity.
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation

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AS 3688	Water supply and gas systems - metallic fittings and end connectors
AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings
AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006
NZ Backflow Testing Standard: NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.3 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Provide general operation and maintenance information as electronic PDF format documents from Manufacturer.

Provide this information prior to practical completion.

1.6 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.



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Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

1.7 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

Performance

1.8 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.

- Test to a pressure of1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

Materials

2.1 COPPER PIPE

To NZBC G12/AS1, 2 Materials. Copper pipe to NZS 3501, AS 1432 (type A, B & C) and AS 3688 for fittings.

2.2 PVC-U PIPE

To NZBC G12/AS1, 2 Materials. PVC-U pipes and fittings to AS/NZS 1477 and PVC-U solvent cements and primers to AS/NZS 3879. Protect from sunlight. For cold water applications only.

2.3 POLYBUTYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polybutylene tubing to AS/NZS 2642.1, AS/NZS 2642.2 and AS/NZS 2642.3 complete with fitings and accessories brand-matched . Protect from sunlight.

2.4 POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polyethylene pipes to AS/NZS 4130 and fittings to AS/NZS 4129. Except for solid black PE, protect from sunlight. For cold water applications only.

2.5 CROSS LINKED POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Cross Linked Polyethylene Pipe to AS/NZS 2492 and fittings to AS/NZS 2537.1, AS/NZS 2537.2, AS/NZS 2537.3 and AS/NZS 2537.4. Except for solid black PE-X, protect from sunlight.

2.6 DE-ZINCIFICATION RESISTANT WATER SUPPLY SYSTEM COMPONENTS

All copper alloy components to comply with G12/AS1 clause 2.2.3 and AS 2345.

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2.7 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.8 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/AS1, 3.4 Backflow protection & 3.5 Containment Backflow protection and NZBC G12/AS1, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection

2.9 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

2.10 EXPANSION VESSEL

Expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4 5.9 Valves and expansion vessels.

Materials - Hot water heating appliances

2.11 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305 NZS 4606.1, NZS 4606.2 and NZS 4606.3, electric water storage cylinder, insulated and complete with required fittings.

Components

2.12 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZS 4305 and AS/NZS 3500.4.

2.13 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.



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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

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

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1 and AS 4809.

3.11 JOINTING PVC-U PIPE

Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to NZBC G12/AS1 and AS/NZS 2032.

3.12 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.13 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

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Application - Pipework installation

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 AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or G12/AS1.

3.16 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures as required by NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

3.17 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.

Application - Hot water systems

3.18 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation or NZS 4607 for Valve-vented systems.

3.19 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.20 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZS 4305 , AS/NZS 3500.4, section 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.

3.21 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11 or NZS 4607 for Valve-vented systems.

3.22 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.23 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.24 INSTALL EXPANSION VESSEL

Install expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4, 5.9 Valves and expansion vessels.

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3.25 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Installation - Valves

3.26 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.

3.27 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.

3.28 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

3.29 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.30 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.31 REPLACE

Replace damaged or marked elements.

3.32 LEAVE

Leave work to the standard required by following procedures.

3.33 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Hot water systems

4.1 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand:	contractor to select
Model size:	300L

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7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES

1 GENERAL

This section relates to the supply and installation of sanitary fixtures, tapware and sanitary accessories.

1.1 RELATED WORK

Refer to 7120 or 7123 HOT AND COLD WATER SYSTEM for hot water cylinders.

Refer to 7420 or 7421 SANITARY SYSTEMS for the supply and fitting of waste disposal pipework Refer to the electrical section/s for electrical connection of accessories.

Documents

1.2 DOCUMENTS

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

NZBC E3/AS1	Internal moisture
NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
NZBC G13/AS1	Foul water
NZBC G13/AS3	Plumbing and drainage
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - water services
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Plumbers, Gasfitters and Drainlayers Act 2006

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Workers or supervisors of work are required to be a Certifying Plumber under the Plumbers, Gasfitters and Drainlayers Act 2006. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

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1.7 NO SUBSTITUTIONS

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

1.8 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

2 PRODUCTS

2.1 SANITARY FIXTURES

Refer to SELECTIONS for product selection.

2.2 TAPWARE

Refer to SELECTIONS for product selection.

2.3 SANITARY APPLIANCES

Refer to SELECTIONS for product selection.

2.4 SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

2.5 ELECTRICAL SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure water supply and drainage pipework match the requirements of selected fixtures without force or distortion.

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION REQUIREMENTS INCLUDING NZBC G13/AS1

Install to NZBC G1/AS1, AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3, NZBC G12/AS1, NZBC G13/AS1, NZBC E3/AS1 and to the fixture manufacturer's installation requirements for each component.

3.6 INSTALLATION SANITARY FIXTURES

Carry out preparatory and assembly work, including connections to supply and drainage services and the application of all required slurries/bedding and sealants in sequence.

Fit the sanitary fixture in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant.



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Seal between all sanitary fixtures and floors, wall linings, fixtures and the tops they are in, the tops and wall linings, to NZBC E3/AS1, 3.2. Fixtures include toilets, urinals, baths, basins, tubs, sinks. Tops include, vanities, bath surrounds, sink benches, etc, and their upstands. Form joint or seal between shower bases or urinals and impervious wall linings to NZBC E3/AS1, 3.3.

3.7 INSTALLING SHOWER OR BATH DOOR AND SCREEN

To NZS 4223.3 and to the product manufacturer's requirements. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating.

3.8 INSTALLATION TAPWARE

In accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1, 6.14 Safe water temperatures.

3.9 SEAL SHOWER TAPWARE

Seal shower wall lining penetrations such as shower head, shower hose, mixer, taps etc to NZBC E3/AS1, Fig. 6.

3.10 SANITARY APPLIANCES

Install and provide all required connections to sanitary appliances in accordance with manufacturers requirements.

3.11 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures using an earth bonding conductor to requirements of NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

Application - sanitary accessories

3.12 INSTALLING ACCESSORIES

Fit specified fittings firmly in place, all plumb and level.

Locate at heights and/or locations shown on the drawings, or as required to comply with NZBC G1/AS1. For any dimension not shown or known, request direction before proceeding

3.13 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.14 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

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7352 TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS

1 GENERAL

This section relates to the installation and commissioning of Type 1 domestic smoke alarm systems.

It includes:

- Power supply
- Associated components to complete the installation

1.1 RELATED WORK

Refer to 7702 ELECTRICAL BASIC for electrical installations such as mains and circuits where required for the supply of power to hard wired smoke alarm 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:

dB(A)	A-weighted decibel
VAC	Volts alternating current
VDC	Volts direct current

The following definitions apply specifically to this section:

Heat alarm	Integral device containing heat detector and alarm sounding feature.
Hush-button	Feature that temporarily silences audible alarm signals triggered by conditions resembling a fire i.e. steam or dust but not generated by sources of fire (nuisance alarm).
Smoke alarm	Integral device containing smoke detector and alarm sounding feature.
Type 1	To NZBC C/AS1 Type 1 is a single smoke alarm or multiple interconnected smoke alarm devices each containing smoke detector and alarm sounding feature.

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
AS/NZS 1125	Conductors in insulated electric cables and flexible cords
AS 1603.17	Automatic fire detection and alarm systems - Warning equipment for people with hearing impairment
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS/NZS 3000	Electrical Installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3808	Insulating and sheathing materials for electric cables
NZS 4512	Fire detection and alarm systems in buildings
NZS 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
BS 5446.3	Detection and alarm devices for dwellings, specification for fire alarm and carbon monoxide alarm systems for deaf and hard of hearing people

Electricity (Safety) Regulations 2010

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Warranties

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 TYPE 1 DOMESTIC SMOKE ALARM SYSTEM

Comply with NZBC C/AS1 providing Type 1 domestic smoke alarm system to NZS 4514.

1.6 NO SUBSTITUTION

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 manufacturer's operation and maintenance information as electronic PDF format documents. Documents to include maintenance, checks, tests and replacement requirements to NZS 4514, Maintenance.

Provide this information prior to practical completion.

2 PRODUCTS

Alarm devices

2.1 MULTI-SENSOR SMOKE ALARM

Multi-sensor smoke alarm to NZS 4514 comprising two or more detection technologies i.e. ionisation and photoelectric smoke sensor or photoelectric smoke and heat sensor. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

2.2 PHOTOELECTRIC SMOKE ALARM

Photoelectric smoke alarm to NZS 4514 comprising photoelectric smoke detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

2.3 HEAT ALARM

Heat alarm to NZS 4514 comprising heat detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply. Refer to SELECTIONS.

Components

2.4 SEALED BATTERY - WIRELESS ALARMS

To NZS 4514, Power Supplies. Long-life (minimum 10 years), non-removable, sealed batteries.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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3.4 COMPATIBILITY

Confirm all interconnected devices are compatible.

Installation - generally

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 LOCATION & SPACING

Location and spacing of smoke alarms to NZS 4514. Install smoke alarms within 10m of each other and a maximum of 5m away from any wall.

3.7 AUDIBLE ALARM

Install smoke alarms so that audible alarm sound pressure level when measured at 1.8m height is between 75dB(A) and 110dB(A) to NZS 4514, Alarm Signals.

Installation - smoke alarm system

3.8 INSTALL BATTERIES

Install primary and secondary batteries to NZS 4514 and manufacturer's instructions. Indelibly mark batteries with the date of installation.

3.9 INSTALL ALARMS

Install alarm devices to manufacturer's instructions fitted neatly and without damage to the surrounding finish using brackets and mounts supplied or recommended by the manufacturer.

3.10 INTERCONNECT

Interconnect devices so that when one activates all alarms sound.

Completion & Commissioning

3.11 COMPLETION MATTERS

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

3.12 COMPLETION - TESTS & CERTIFICATION

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

Completed smoke alarm system to be inspected, tested and where required for electrical installations certified to NZS 4514, including (but not limited to):

- Correct location of alarm devices
- Correct sound pressure level of audible alarm signals
- Correct installation to manufacturer's installation instructions
- Correct and fault free operation of the smoke alarm system and interconnected devices



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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 4311ME METALCRAFT ESPAN ROOFING for installation of longrun sheet roofing

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.

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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 FASCIA SYSTEM

Metalcraft fascia system complete with custom fixing bracket to suit. Available in Fascia 135, Fascia 155 and Fascia 185.

2.2 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

2.3 DOWNPIPES - METAL

Metalcraft metal downpipes, circular or rectangular. Refer to SELECTIONS.

Components

2.4 DROPPERS

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

2.5 DOMES

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

2.6 GUTTER MESH

Flexible plastic mesh fitted into the gutter to the mesh manufacturer's requirements.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

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



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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 METAL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. All installation to Metalcraft Roofing details and NZMRM CoP recommendations, section 5.7,Outlets & Downpipes.

3.7 INSTALL RAINWATER HEADS

Install using rivets where required to detail as shown on drawings. Ensure colour matched blind aluminium rivets are used when joining metal surfaces.

3.8 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

3.9 INSTALL PROTECTION

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

Completion

3.10 REPLACE

Replace damaged or marked elements.

3.11 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

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7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

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

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

Stainless steel pipe and associated fittings
PVC,PE polyethylene or polypropylene pipe including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to NZBC G13/AS1 and NZBC G1/AS1 and complete all tests to G13/AS1, 7.1 Test Methods.

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to ensure metallic waste pipes connected to metallic drains and attached metallic sanitary fixtures using an earth bonding conductor to requirements of AS/NZS 3000, 5.6 Equipotential bonding.

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3.4 INSTALL TRAPS, WASTE AND VENT PIPES - NZBC G13/AS1

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1 and jointing for PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.5 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.6 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations,as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.7 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.



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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

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Components

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

Underground PVC-U pipe to be classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 PERFORATED PIPE - SUBSOIL DRAINAGE

Perforated corrugated coil high density polyethylene subsoil drainage pipe to AS 2439.1 with polypropylene filter sock over, for groundwater drainage.

2.5 GULLY TRAPS - NZBC G13/AS2

To NZBC G13/AS2: 3.3 Gully traps, complete with grating.

2.6 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.7 INSPECTION COVERS

Cast iron frame with screw-down cover.

Foul water

2.8 TRENCH BACKFILLING MATERIAL, FOUL WATER - NZBC G13/AS2

Bedding and backfilling material to NZBC G13/AS2, 2.0 Materials**,** for methods shown in NZBC G13/AS2, figure 7, Bedding and backfilling.

Subsoil

2.9 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Free draining crushed stone, 7 mm to 20 mm in size.

Concrete masonry retaining walls

2.10 DRAINAGE MATERIAL - SIMPLE STANDALONE CONCRETE MASONRY RETAINING WALLS

Free draining imported hardfill to the NZTA F2 specification.

Filter material comprised of clean, durable stone having a crushing resistance of not less than 100 kN when tested in accordance with NZS 3111, or a mixture of such material with clean hard sand. The filter material when tested in accordance with NZS 4402, shall comply with the following gradings:

TEST SIEVE APERTURE	PERCENTAGE PASSING
26.5mm	100
13.2mm	85-100
9.5mm	80-95
4.75mm	65-85
2.36mm	50-70
1.18mm	35-55
600µm	18-40
300µm	3-25
150µm	8 maximum
75µm	0

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Accessories

2.11 FILTER FABRIC

Polymeric fabric formed from a plastic yarn or a long chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, amide, ester or vinylidene chloride. Fibres to be rot proof, chemically stable and have low water absorbency. The filter network, (woven or non-woven) must be dimensionally stable and resistant to delamination.

3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.
Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, Proximity of Trench to Building, for stormwater and subsoil drains.
- AS/NZS 3500.3, 6.2.8, Installation near and under buildings, as modified by NZBC E1/AS2.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 FOUL WATER DRAINAGE GENERALLY - NZBC G13/AS2

Carry out foul water drainage work to NZBC G13/AS2 and NZBC G1/AS1 and complete all tests to NZBC G13/AS1, 7.1 Test Methods.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033.

3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.5 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to NZBC G13/AS2, 3.3 Gully traps.

3.6 INSTALL SURFACE WATER SUMP

To NZBC E1/AS1 or to AS/NZS 3500.3 section 7 as modified by NZBC E1/AS2, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.7 INSTALL FOUL WATER INSPECTION CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing to NZBC G13/AS2, 5.7 Access points. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.8 SOAKHOLES OR TRENCHES

Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.

3.9 TESTING - FOUL WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed.
Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Backfilling and encasement - Foul water and surface water

3.10 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

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3.11 TRENCH BACKFILLING GENERALLY - FOUL WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.12 FOUL WATER TRENCH BACKFILLING - NZBC G13/AS2

Carry out foul water trench backfilling to/NZBC G13/AS2, 5.3 to 5.5 and fig 7.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

Subsoil ground water drainage

3.13 FILTER FABRIC TO DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Where details require drainage material to be encapsulated in filter fabric to prevent fines from blocking the aggregate. Place fabric and carefully hold in place by pinning and/or by controlled use of aggregate as ballast. After drain installation and required backfilling, complete encapsulation with fabric. Ensure filter fabric is correctly placed, sufficiently overlapped and pinned and/or secured.

3.14 LAY PERFORATED PIPING - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. Lay in straight runs to discharge into surface water drainage system. The pipe must not excessively elongate during installation. Carry drainage material up and over the pipes without disturbing them. Extend the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.15 LAY PERFORATED PIPING TO BASEMENT WALLS - SUBSOIL DRAINAGE

Ensure any required waterproofing and protection sheets are in place before starting work.

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. The pipe must not excessively elongate during installation. Lay in straight runs to 1:150 gradients with invert of the highest horizontal point 50 mm minimum below floor slab level, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Fill with drainage material to full height of wall. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.16 LAY PERFORATED PIPING TO RETAINING WALLS - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage metal comprising of filter material to the NZTA F2 specification. Pipe bedding not less than 75mm deep. Backfill not less than 300mm deep. The pipe must not excessively elongate during installation. Lay in straight runs to correct gradients , discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Place granular fill in layers not exceeding 150 mm thick loose depth, to full height of wall, with an allowance for the thickness of the surface finish. Compact to provide support of not less than that of the adjacent material. Where geocomposite drain is used, the backfill shall follow the manufacturer's recommendations. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.17 CLEAN OUT SUBSOIL DRAIN INSTALLATION

Clean and flush out the whole subsoil drain installation and remove silt and debris before handing over.

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7545 UNDERFLOOR HEATING

1 GENERAL

This section relates to the supply and installation of a Hydronic Underfloor Heating (UFH) system for domestic or commercial applications.

1.1 RELATED WORK

Refer to 7211 GAS SYSTEM UTILITY NETWORK for piped gas supply.

Refer to 7212 GAS SYSTEM LPG CYLINDERS for cylinder gas supply
Refer to electrical section/s for electric power supply and water heating system for underfloor heating.
Refer to the appropriate concrete section for insulation under concrete slabs.
Refer to the HOT & COLD WATER SYSTEM section for hot and cold water piping, gas water heaters and hot water cylinders.

1.2 ABBREVIATIONS

The following abbreviations are used in this specification.

UFH	Underfloor Heating

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC G10/AS1	Piped services
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 3500.4	Plumbing and drainage - Heated water systems
BS EN 1264	Floor heating - Systems and components
BS 7291	Thermoplastic pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings

Gas (Safety and Measurement) Regulations 2010
Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
Plumbers, Gasfitters and Drainlayers Act 2006

Requirements

1.4 ACCREDITED INSTALLERS

Installers shall be accredited by the proprietary UFH manufacturer. The installer is responsible to insure any equipment connected to the controls and supplied by others is suitable for the purpose and installed to manufacturer requirements.

1.5 QUALIFICATIONS

Plumbers to be certified installers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance manual information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

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Warranties

1.7 WARRANTY

Warrant this part of the work under normal environmental and use conditions against failure of materials and execution.

Warranty period: 5 years

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

Performance

1.8 GENERAL INSPECTIONS

Inspection of the work to take place at each of the stages as scheduled. Confirm a written programme to facilitate these inspections, including notification when each stage of the work is ready for inspection.

1.9 FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

Testing should be at the time of completion. Confirm this timing before carrying out any tests. Test and demonstrate the system according to piping manufacturer's specifications.

2 PRODUCTS

Materials

2.1 PIPEWORK

To BS 7291, AS/NZS 2492, NZBC B2/AS1, NZBC G10/AS1, NZBC G12/AS1. Refer to the SELECTIONS for pipe type and size.

2.2 CONTROLS

Controls include water temperature controls, boiler controls and air temperature controls. Refer to SELECTIONS for type.

2.3 INSULATION - OVERLAY FLOOR SYSTEM

Proprietary combined insulation and pipe fixing system. Refer to SELECTIONS for type.

Components

2.4 MANIFOLD

Thermostatically controlled multi-valve manifold to control the temperature of the water and control the flow rate to the various zones. The manifold is available in a range of sizes. Refer to SELECTIONS for port arrangement.

2.5 PUMPING UNIT

Pump to take heated water from the primary boiler and inject the water down to the required temperature for the UFH. Refer to SELECTIONS for type.

2.6 MIXING VALVE

Mixing valve to mix the 80°C water from the boiler with the cooler water from the return of the floor heating circuits. Refer to SELECTIONS for type.

2.7 THERMOSTATS

Programmable thermostats complete with setback temperature reduction mode. Refer to manufacturer for options to use in wet areas. Refer to SELECTIONS for type and location.

2.8 HEAT SOURCE

Refer to SELECTIONS for type.

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Finishes

2.9 FLOOR COVERING

Refer to SELECTIONS for type of floor covering.

3 EXECUTION

Conditions

3.1 GENERALLY

To AS/NZS 3500.4, BS EN 1264, NZBC B2/AS1, NZBC G10/AS1, NZBC G11/AS1, NZBC G12/AS1 or AS/NZS 3500.4 as modified by NZBC G12/AS3. Confirm suitability of heat source, concrete/screed, insulation, floor finishes with the manufacturer before installation of the UFH system.

3.2 INSTALLATION

Ensure the area for installation remains dry and weathertight by incorporating a damp-proof membrane in the floor slab. Lay insulation to the total area of the installation, with edge insulation on all internal and external wall lines. If the floor construction is a two part slab with the walls already in place edge insulation is required around the walls to prevent heat loss up the walls.

3.3 INSULATION - OVERLAY SYSTEM

Confirm suitable insulation material and thickness with UFH manufacturer.

Application

3.4 HEAT SOURCE

Confirm suitability of the heat source with the UFH system, before connecting it to the UFH installation. Comply with AS/NZS 3500.4 as modified by NZBC G12/AS3 and Electricity (Safety) Regulations 2010. When using a gas heat source comply with Gas (Safety and Measurement) Regulations 2010.

3.5 PIPEWORK LAYOUT

Lay pipes to provide an even spread of heat and a relatively even surface temperature across the area to UFH manufacturer's recommendations. Lay pipes to the layout pattern recommended by the manufacturer and approved by the owner. Insure the layout allows for increased heat required against colder exterior surfaces (perimeter zone).

3.6 INSTALL PIPEWORK - OVERLAY SYSTEM

Pipework fixed onto the insulation board to manufacturer's recommendations. Lay pipes in a continuous length from the manifold in the pre-designed configuration. Connections must not be made in the area to be screeded. Pipes start and finish at the manifold position. Pipes must run to the corresponding port on the manifold. Do not cross pipes over in the floor. Allow for pressure testing of the pipework to 600kpa. Leave at this pressure until concrete is cured.

3.7 SCREED - OVERLAY SYSTEM

Install screed as specified under the appropriate concrete section to provide a minimum thickness of 45mm above the crown of the water heating pipework. For a one pour slab use 40mm chairs to support the mesh. Refer to manufacturer's requirements.

Lay the screed as soon as possible after laying the pipe circuits and completion of a pressure test. Leave the system pressurised throughout the screeding and curing process. Allow the screed to cure in accordance with manufacturer's instructions. Lay the screed in good contact with the pipes without any air pockets.

3.8 CONDUIT SLEEVING

Sleeve all flow pipes with conduit sleeving where the pipe enters and returns from concrete for the first metre to manufacturer's requirements. Sleeve across construction joints in floor.

3.9 FILLING AND PRESSURE TESTING

Pressure test the system with water to ensure all joints are watertight and no damage has occurred to the pipe during installation.

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3.10 CONNECT TO HEAT SOURCE

Install pump and manifold when wall finishes are completed. Connect heat source to pump pack using recommended pipe and fittings to manufacturer's installation instructions.

Finishing

3.11 INITIAL START UP

The start up procedure following installation to be done to BS EN 1264 and to UFH manufacturer's requirements.

Completion

3.12 COMMISSIONING

Commission the UFH system. Pipes flushed and refilled with the use of an inhibitor. Following the initial start up period commission the system with all floor coverings laid to ensure the system can be correctly balanced. Ensure the complete central heating system, including radiators if present, is working to required operational temperature. Adjust each circuit slowly via the valves on the manifold to ensure an even flow and heat up is achieved.

3.13 FLOOR FINISHES

Run the system for two weeks before the floor covering is finally laid. Use adhesive suitable for temperatures up to 40°C.

3.14 REPLACE

Replace damaged or marked elements.

3.15 LEAVE

Leave work to the standard required by following the UFH system manufacturer's recommended procedures.

3.16 REMOVE

Remove debris, unused materials and elements from the site.

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7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 RELATED WORK

Refer to 7120 HOT & COLD WATER SYSTEMS for water heaters

7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary appliances
7352 TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS for Type 1 interconnected smoke alarm system for domestic buildings.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
COC	Certificate of Compliance
ELV	Extra Low Voltage
IP	international (ingress) protection classification
MCB	Miniature circuit breakers
NUO	Network Utility Operator
PCB	printed circuit board
RCCB	Residual Current-operated Circuit Breaker
RCD	Residual Current Device
SIA	security integration architecture
TCF	Telecommunications Carriers' Forum

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation of buildings
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 2648.1	Underground marking tape - Non-detectable tape
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)

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AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3111	Approval and test specification - Miniature overcurrent circuit-breakers
AS/NZS 3112:2017	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
NZS 3604	Timber framed buildings
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60898	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Series
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61008.1	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - Part 1: General rules
IEC 61009.1	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
IEC 61643	Components for low voltage surge protection devices
IEC 62423	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
IEC 62606	General requirements for arc fault detection devices

Electricity (Safety) Regulations 2010
NZ Telecommunications Forum (TCF) Premises Wiring Guidelines
Private Security Personnel Investigations Act 2010

Warranties

1.4 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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

Requirements

1.5 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Guidelines for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.6 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Electrical workers holding a current Practising Licence (with an appropriate Registration class) to carry out prescribed electrical work. An Electrical Worker who holds a Trainee Limited Certificate or a Limited Certificate to be supervised by a licensed electrical worker with an appropriate Registration class.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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1.7 NO SUBSTITUTIONS

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

1.8 CONFIRM SELECTIONS

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

Requirements - Compliance

1.9 ELECTRICAL CERTIFICATE OF COMPLIANCE

At the completion of electrical work provide a Certificate of Compliance (CoC) to Electricity (Safety) Regulations 2010, regulation 65-67. Provide a copy to the Contract Administrator and NUO prior to connection and when required to the BCA for Code Compliance.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high risk electrical work as required by Electricity (Safety) Regulations 2010, regulation 70 High-risk prescribed electrical work to be inspected.

1.10 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the Contract Administrator and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Other information required by the BCA in the Building Consent Approval documents



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2 PRODUCTS

2.1 MAINS SUPPLY

Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.3 EARTH ELECTRODE

To AS/NZS 3000, 5.3.6 Earth electrodes and Table 5.2 Acceptable Earth Electrodes. Installed as a vertical-type electrode to a minimum depth of 1.8m or a strip-type electrode buried in horizontal trench with not less than 0.5m cover and minimum horizontal length of 7.5m.

2.4 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A to AS/NZS 3000, 2.3.3 Main Switches and additional isolating switches to AS/NZS 3000, 2.3.4 Additional isolating switches.

Residual current protection, maximum sensitivity of 30mA, to AS/NZS 3000, 2.6 Additional Protection by Residual Current Devices, as modified by Electricity (Safety) Regulations 2010. RCD and RCCBs' to meet Type A to IEC 61009.1 / IEC 61008.1 or Type F or Type B RCD to IEC 62423.

Miniature Circuit Breakers (MCB) to AS/NZS 60898 series or AS/NZS 3111, 4.5kA domestic or 6kA for commercial.

2.5 CIRCUIT PROTECTION - ARC FAULT DETECTION DEVICES

Arch Fault Detection Devices (AFDD) to IEC 62606 and to AS/NZS 3000, 2.9 Protection against fire hazard due to Arching Faults. Provide to all final subcircuits not exceeding 20A.

2.6 SURGE PROTECTION

Provide surge protection device(s) to AS/NZS 3000, Appendix F Surge Protection Devices. Protection for the home's appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.

2.7 DEGREES OF PROTECTION - DAMP CONDITIONS

For electrical equipment installed in classified zones (baths, showers, and other fixed water containers), provide a degree of protection to AS/NZS 3000, clause 6.2.4.1.

Zone 0	IPX7
Zones 1 and 2	IPX4
Zone 3	no specific degree of protection

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Refer to AS/NZS 3000, Table 6.1 for requirement for selection and installation of electrical equipment.

For other damp situations such pools, water features, saunas, refrigeration rooms and in areas used for sanitization or general hose down operations, refer to AS/NZS 3000, section 6 for required degree of protection.

2.8 LIGHT FITTINGS

To AS/NZS 3000, 4.5 Lighting Equipment and Accessories and if required, complete with lamps and, if required, transformer and control gear for dimming. Refer to SELECTIONS.

2.9 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to AS/NZS 3113. Terminal type. Suspended fittings to have sheathed round flexible cord to AS/NZS 3008.1.2. Refer to SELECTIONS.

2.10 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.11 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

- Existing fittings or retrofit situations, fittings maybe unmarked.
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F, & IC-4.

Refer to SELECTIONS.

2.12 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance. Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

Refer to SELECTIONS.

2.13 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with Electrical (Safety) Regulations 2010, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.14 HEATED TOWEL RAILS

Fixed wired heated towel warmers, IPX4 splash-proof, compliant with Electrical (Safety) Regulations, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.15 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board. Refer to SELECTIONS.

Signage

2.16 WARNING SIGNAGE - RECESSED LUMINAIRES

To AS/NZS 3000, 4.5.2.3.2 Warning Signs.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install electrical wiring and systems in accordance with Electricity (Safety) Regulations 2010, AS/NZS 3000 and other cited standards.

3.6 MAIN SUPPLY

Lay underground mains to the NUO and AS/NZS 3000, 3.11 Underground Wiring Systems requirements. Excavate trench, ensure minimum depth of cover to AS/NZS 3000 Table 3.6 Under-Ground Wiring Systems - Minimum Depth of Cover, install cable and marker tape complying with AS/NZS 2648.1 and backfill. If required, provide permanent cable marker signs to indicate the point where a cable enters or leaves a structure.

3.7 LABELLING

To AS/NZS 3000, 2.10.5 Equipment identification, include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

3.8 CIRCUIT BREAKERS

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.9 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.

If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached electrical units or equipment

3.10 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.

If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

3.11 MAIN EARTH

Install main earthing conductor to AS/NZS 3000, 5.5.1 Main Earthing conductor. Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.12 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A. Install to AS/NZS 3000, Appendix O, Installation of Arc Fault Detection Devices (AFDD'S)

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3.13 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000, Appendix F, F1.2.2 Installation.

3.14 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets (except for fixed or stationary cooking equipment), lighting & directly connected handheld electrical equipment, to AS/NZS 3000, 2.6.3.3.1 Residential installations - New Zealand only.

3.15 RCD - DAMP SITUATIONS

Install 30-mA RCD protection as required to AS/NZS 3000, section 6 for damp situations, including in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.

3.16 SET-OUT - OUTLETS & EQUIPMENT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.17 CABLING

Install wiring systems to AS/NZS 3000, Section 3 Selection and Installation of Wiring Systems. All cabling run concealed fix in position by suitable clips, saddles or clamps. Where possible, run cabling horizontally / vertically in straight line.

Locate holes in timber framing for the passage of cables at the centre line of member ensuring structural strength in maintained to NZS 3604 requirements. In steel studs/ structural steel, ensure aperture is brushed and shaped to minimize abrasion of cable. Cables may be supported by suspended ceiling systems unless not permitted by suspended ceiling manufacturer. Install cable in conduits where required to pass through concrete or underground.

3.18 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.

3.19 OUTDOOR/EXTERIOR SERVICES

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems, in accordance with AS/NZS 3000 and the fixture/fitting manufacturer's recommendations.

Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services to AS/NZS 3000, 3.11 Underground Wiring Systems.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56 minimum. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet.

3.20 PROTECTION OF CABLING NEAR BUILDING SURFACES

Protect concealed wiring to AS/NZS 3000, 3.9.4 Protection against mechanical damage, where wiring is fixed in position by fastening, or held in position by thermal insulation or passes through an opening in a structural member and they are located within 50mm from the surface of a wall, roof, ceiling or floor.

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3.21 LIGHT FITTINGS

Install light fittings in locations and at heights as confirmed by the Contract Administrator, when not specifically shown on the drawings. Install to the luminaire manufacturer's requirements (including clearances) and to AS/NZS 3000, 4.5 Lighting Equipment & Accessories, in correct orientation for light output, complete with lamps.

Fix through linings to structure or framing, provide additional nogs, trim and packing if required. Ensure transformers/drivers and luminaires are adequately ventilated and clear of any building elements, to AS/NZS 3000.

3.22 INSULATION CLEARANCES

Refer to relevant INSULATION section.

3.23 INSULATION CLEARANCES – RETROFIT RECESSED LUMINAIRES

For retrofitting or replacement recessed luminaire applications, check insulation clearances to NZS 4246, AS/NZS 3000, 4.5.2.3 and, where allowed by these standards, to the light manufacturers stated insulation clearances.

3.24 AIR CONDITIONING & HEAT PUMP SYSTEMS

Connect to electricity supply to manufacturer's requirements and to AS/NZS 3000, 4.19 Air Conditioning & Heat Pump Systems. Any system incorporating a compressor shall be provided with a lockable isolating switch installed adjacent to the unit.

3.25 COOKING APPLIANCES

Install cooking appliances to manufacturer's requirements and to AS/NZS 3000, 4.7 Cooking appliances. Provide a switching device to all cooking appliances that have an open cooking surface such as a hob in a visible and accessible position within 2m of appliance, but not in prohibited location, refer to Figure 4.17.

3.26 ELECTRICAL FIXTURES

Install all electrical fixtures and wire to AS/NZS 3000, 4.3 Connection of Electrical Equipment, and manufacturers requirements. Refer to SELECTIONS. If required, provide operating or isolating switches.

Completion & Commissioning

3.27 WARNING SIGNS - RECESSED LUMINAIRES

Where recessed luminaires are installed in an accessible roof space, install warning sign to AS/NZS 3000 requirements.

3.28 COMPLETION MATTERS

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

3.29 COMPLETION - TESTS & CERTIFICATION

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

Testing:	To Electricity (Safety) Regulations 2010 and AS/NZS 3000, 8.3 testing
Certificate of Compliance:	To Electricity (Safety) Regulations 2010 and ensure Verification Records supplied to AS/NZS 3000, clause 8.4
Submit results to:	Contract Administrator

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8420 MISCELLANEOUS SITE WORKS

1 GENERAL

This section relates to the supply and installation of hard landscaping including:

- paths
- fencing
- other minor structures

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

1.2 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZBC F9/AS1	Means of restricting access to residential pools
NZS 3104	Specification for concrete production
NZS 3114	Specification for concrete surface finishes
NZS 3124	Concrete construction for minor works
AS/NZS 4671	Steel reinforcing materials

Requirements

1.3 QUALIFICATIONS

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

2 PRODUCTS

2.1 CONCRETE

Normal concrete or prescribed mix concrete, maximum aggregate size 19mm to NZS 3104.

2.2 SITE MIXED CONCRETE

To NZS 3124. Prescribed mix 17.5 MPa minimum strength, using either separate batching of sand and coarse aggregate to NZS 3104, or builder's mix.

2.3 REINFORCEMENT

To AS/NZS 4671. Welded reinforcing mesh to AS/NZS 4671.

3 EXECUTION

3.1 CONSTRUCT CONCRETE PATHS AND DRIVEWAYS

Excavate for path thickness and hardfill. Remove plants, tree roots and soft fill to firm subgrade. Compact with a plate vibrator to form a level surface of even bearing. Place and compact a layer of basecourse. Reinforcement where scheduled to AS/NZS 4671. Place concrete with a fall of 1:100 (minimum) and construction joints/saw cuts, thickness and finish to NZS 3114 as scheduled and NZS 3124 Specification for concrete construction for minor works.

3.2 INSTALL GATES

Hang gates on corrosion resistant hinges/dogs. Check operation of gates to ensure that they swing clear of the ground and other features. Fit scheduled gate hardware.

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4 SELECTIONS

4.1 CONCRETE DRIVEWAYS

Basecourse thickness:	150mm minimum
Concrete thickness:	100mm minimum
Concrete strength:	20MPa
Reinforcement:	665 mesh or equivalent
Finish:	confirm with owner

4.2 GATES

Type:	contractor to select
Height:	contractor to select
Finish:	powder coated to match roofing
Hardware:	electric lock

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