Lot 1192, Hanleys Farm

Young+
Richards+

Project Specification

21 Angus Rise, Jacks Point, Queenstown , New Zealand
Project Ref: 260116
Date: 30 October 2026



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

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7701 ELECTRICAL BASIC 311

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Young & Richards Limited
Trading As:	Trading as Young+Richards+ (herein after may also be referred to as Y+R+)

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1.2 REVISION CONTROL

Issue:	BC-CONSTRUCTION
Revision:	01
Date of Issue:	15/01/2026

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1112YR TERMS AND CONDITIONS OF USE

1 GENERAL

1.1 CONFIDENTIALITY

Condition: This specification is confidential in terms of the Building Act 2004 and shall not be reproduced without prior written approval / consent from Young & Richards Limited

1.2 LEGAL ENTITY AND TRADING NAME

Condition: Young & Richards Limited is a New Zealand registered limited company (2187700) trading as Young+Richards+ (herein after may also be referred to as Y+R+).

1.3 GENERAL TERMS AND CONDITIONS - ALL DOCUMENTATION

Applies To: All Y+R+ Documentation including and not limited to: Drawings, Details, specifications, calculations, technical sheets encompassed within the Building Consent application

Conditions: This specification has been prepared by Young & Richards Limited Trading as Young+Richards+ expressly for the confidential and proprietary use by our client and in strict adherence of the contractual terms within the agreement between Y+R+ and our client.

This specification solely encompasses the information accessible to Y+R+ at the time of its writing and is only issued contingent upon the accuracy and completeness of the information available at that time.

Young + Richards Ltd accepts no liability or responsibility whatsoever for any loss or damage suffered by the reliance of this specification connection with any third party. By accessing this specification or using the information contained within, the user confirms acceptance of the above conditions.

1.4 MANUFACTURERS LITERATURE

Condition: It is the Contractor’s responsibility that the construction team have access to and are familiar with the current editions of manufacturer's literature of all specified products within this specification.

1.5 INCONSISTENCIES IN CONTRACT DOCUMENTS

Condition: Refer to the General Conditions of Contract relating to this project.

Applicable Contracts: Standards New Zealand document Conditions of Contract for Building and Civil Engineering Construction NZS 3910, 3916, 3917 (Current Editions.)

1.6 ASSOCIATED SERVICES FEES AND PAYMENTS

Condition: Under no circumstances is Young & Richards Limited (Y+R+) liable for payment for any product, service or fee specified within the Drawings and or Documentation associated to this project.

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1211YR COORDINATION

1 GENERAL

1.1 COORDINATION - GENERAL

Condition: It is the responsibility of the Contractor to ensure that all items required to complete the project are fully allowed for and that each inter-face is accurately delivered to the relevent sub-contractors. The Contractor is responsible for ensuring that their Contractors Sum accounts for the full extent of work required and any reasonably foreseeable works, has been adequately allowed for. The Contractor is responsible for understanding the scope of each sub-trades and ensuring each trade is fully coordinated and accounts for the full scope of works describe in the Pricing Documents. Individual technical specification sections are not intended to be read in isolation. The Contractor is responsible to ensure all necessary information is provided to each of the Sub-contractors.

1.2 COORDINATION - DRAWINGS AND DOCUMENTATION

Condition: Any reference to ‘drawings’ and or ‘documentation’ here within, specifically implies all associated drawings and documentation as tendered or within the construction set; this includes all associated consultants drawings documentation, reports and or schedules

1.3 COORDINATION - DOUCMENTATION FAMILIARISATION

Condition: The Drawings and Specifications complete with Appendices and Schedule of Quantities (should they apply to the project) shall be read together and the works shall be completed according to the true intent and meaning of the same. Read all sections of this Specification together and with all other sections.

The whole of the work shall be completed to the true intent and meaning of the drawings and specifications. Work not specifically shown on the drawings or described in the specifications is deemed to be included should this normally be required for the proper completion of the Contract. Anything shown on the Drawings and not Specified, or Specified and not shown on the Drawings or Schedule of Quantities (should they apply to the project), shall be equally binding as though included in both.

Should any error or inconsistency appear in or between these Documents, the Contractor shall report the discrepancy to the Contract Administrator for instructions. Where the contract documents as a whole show the extent of work required, the Contractor shall allow for completion of the full extent of work. The lack of detail is not a reason to claim for a variation if it is clear the work is to be included and required. Should the Contractor feel there is insufficient detail in any part of the Contract clarification must be obtained during the tender period, or included as part of the Contract.

The Contractor shall see that the contract, drawings and specifications are fully and faithfully complied with at all times by all sub-Contractors, material suppliers and workmen, that all work is executed with the utmost diligence and that all materials are provided promptly so as not to delay the work. In no case shall any changes be made from the drawings and specifications without prior written authorization from the Contract Administrator. Any deviation from the Documents may be cause for rejection of the work.

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1.4 CO-ORDINATION - WORK

Condition: The Contractor shall co-ordinate the work to ensure that the requirements of the Contract Documents are met. In particular, the Contractor shall co-ordinate the demolition of the building work including retained structures and services. The Contractor is responsible for the co-ordination of the Subcontractors work. The Contractor shall hold Coordination Meetings with Subcontractors, suppliers, etc at intervals as necessary to ensure the coordination of all work. The Contractor shall allow for all costs incurred

1.5 COORDINATION AND COMPLETENESS

Condition: The Contractor is responsible for ensuring that they have allowed for the full extent of all works required or reasonably foreseeable as outlined by the contract documents. The main contract contractor along with the sub-trade tenderers are responsibility for familiarisation with the requirements for each of the sub-trades, the attendance required on site, the extent and coordination of each and ensuring full scope of services is understood at the time of tender. The subsequent Individual Technical Specification Sections are not intended to be read in isolation. The Main Contractor is responsible for ensuring all necessary information is provided to each of the subcontractors. Further information regarding services contract coordination requirements of the Main Contractor are broadly outlined in the following clauses. This list is not to be taken as complete or exhaustive. The Main Contractor is full responsible for any gaps between subtrades.

1.6 COORDINATION - STRUCTURAL DRAWINGS BRACING AND PENETRATIONS

Condition: The Contractor shall co-ordinate between the structural drawings (Specifically braced walls and ceilings) against all required penetrations / cut outs and the like required by the sub-contractors prior to the start of any working involving the above. Any discrepancies are to be brought to the attention of Young + Richards immediately for their consultation.

1.7 COORDINATION - STRUCTURAL DRAWINGS BRACING AND PENETRATIONS

Condition: All works under this contract must comply with the NZ Building Code to the extent required by the Building Act 2004 (and its current amendments), whether or not a building consent is required for the building work under the Act for this contract.

The Contractor must comply with all Territorial Authority and BCA Inspection requirements under any Consents or Approvals given in relation to this project.

Any change to the Contract Documents directed by the territorial or any other authority shall not be undertaken without the knowledge or approval of the Engineer to the Contract (ETC). Should the Contractor consider that any approval or consent given by the territorial or any other authority has a material affect on the Contract Works, the Contractor shall refer the approval or consent condition to the ETC within 5 working days of receipt.

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1.8 COORDINATION - SEPARATE CONTRACTORS/SUBCONTRACTORS

Condition: Allow for general attendance on Separate Contractors and Subcontractors as follows:

Requirements:
Use of scaffolding and hoisting provisions for normal building requirements specialist scaffolding to be included in the separate contractor tender package
use of messrooms, sanitary accommodation and welfare facilities on site
space for the siting of subcontractor's accommodation
safety provisions on site
rubbish removal
space for storage of subcontract materials
Lighting suitable for carrying out normal building trades power connections for specialist lighting
connection points for water, compressed air, and power

1.9 CO-ORDINATION - WINDOW AND DOORS

Condition: The builder and aluminum joinery fabricator are to ensure that they have reviewed and coordinated between the drawings and documentation, specifically floor plans, elevations, flashing details and the joinery schedules. They are to perform an onsite check and confirmation prior to the start of fabrication on the following requirements:

Requirements:
That all window and door heights are consistent in nature.
Ensure that there are no internal joinery clashes between windows and doors, specifically in the areas around the kitchen bench and bathroom vanities and the like. confirm joinery heights against all corresponding windows and that there is enough room above the bench for any upstand and or trim.
Ensure that all thresholds/ set downs have been fully coordinated, with all joinery rebates in concrete to be sealed with paint on waterproofing product such as mulseal or equally approved.
That it is the windows manufacturers responsibility to ensure correct weather-tightness of all windows & doors and their installation. provide all necessary flashings and accessories as required to fulfil the intent of a weathertight system. prior to fabrication allow to discuss with architect specific installation details & provide details if required. all windows are to have continuous air seals around all edges, expanding foam or similar.
All gaps are to be filled.
That the windows and doors prescribed on the elevations and floor plans match the window and door schedule accordingly, both of which are equally binding in nature and intent.
It is the responsibility of the contractor to ensure that all items required to complete the project are fully allowed for and that each inter-face is accurately delivered to the relevent sub-contractors. the contractor is responsible for ensuring that their contractors sum accounts for the full extent of work required and any reasonably foreseeable works, has been adequately allowed for.

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1.10 COORDINATION - CONSTRUCTABILITY / BUILDABILITY

Condition: The Contractor is required to undertake a full review of the documentation prior to their tender submission for all aspects associated around constructability and or building of the Drawings, Design Intent and Documentation.

Unless clarified within the Contractor's Tender, it will be taken that there are no constructability and or buildability issues associated with the Drawings, Design Intent and Documentation and the Contractor has all the necessary skills, experience and resources to construct the building in accordance with the above.



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1231 CONTRACT

1 GENERAL

1.1 FORM OF CONSTRUCTION CONTRACT

Form of contract: Refer to the Project Administrator for Confirmation
Generally the New Zealand document Conditions of Contract for Building and Civil Engineering Construction NZS 3910, 3916, 3917 (Current Editions.)

1.2 NOMINATED SUBCONTRACTORS

Requirement: Refer to the conditions of contract and or the Project Administrator for any Nominated Contractors that the Principal is engaging the following to concurrently carry out work not included in the main contract.

1.3 SEPARATE CONTRACTORS

Requirement: Refer to the conditions of contract and or the Project Administrator for any separate contractors that the Principal is engaging the following to concurrently carry out work not included in the main contract.

1.4 PROVISIONAL SUMS

Requirement: Refer to the conditions of contract and or the Project Administrator for any Provisional sums that maybe included in the contract for the supply of materials by the contractor or a nominated subcontractor for incorporation into the contract works. The sums include for the net supply price including delivery to the site plus a reasonable allowance for the contractor's expense and profit/margins.
Type: Refer to the Project Administrator for Confirmation
Amount: Refer to the Project Administrator for Confirmation

1.5 PRIME COST SUM

Requirement: Refer to the conditions of contract and or the Project Administrator for any Prime Cost Sums that maybe included within the contract for the supply of materials by the contractor or a nominated subcontractor for incorporation into the contract works. The sums include for the net supply price including delivery to the site plus a reasonable allowance for the contractor's expense and profit/margins.
Type: Refer to the Project Administrator for Confirmation and
Amount: Refer to the Project Administrator for Confirmation

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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.

1.6 YOUNG & RICHARDS LIMITED

Condition: Young & Richards Limited trading as Young+Richards+ herein after may also be referred to as Y+R+

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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

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

1.1 EXPLANATION OF SCHEDULE SECTIONS

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

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

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

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

1235S1 Schedule of Shop Drawings
1237S1 Schedule of Warranties
1238S1 Schedule of As Built Documentation
1239S1 Schedule of Operation & Maintenance Info
1278SR Schedule Of Slip Resistance Testing

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1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

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

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

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

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

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

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

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

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

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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 INITIAL ISSUE & REVISIONS - HARD COPIES

Initial issue:	1 at full size, 1 at reduced size (if relevant)
Revisions:	1 at full size, 1 at reduced size (if relevant)

2.2 DOCUMENT RECEIPT - HARD COPIES

Hard copies of plans, specifications and other documents issued for construction shall be obtained sent to an agreed address.

2.3 DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS

Electronic documents issued for construction shall be obtained as an email attachment sent to an agreed address.

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1235 SHOP DRAWINGS

1 GENERAL

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

1.1 SCHEDULE SECTION

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

1.2 SHOP DRAWING FORMAT

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

1.3 PROGRAMME FOR SHOP DRAWINGS

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

1.4 COMMUNICATION WITH SHOP DRAWING DETAILER

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

1.5 CONTRACTOR COORDINATION OF SHOP DRAWINGS

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

1.6 COORDINATION WITH SITE MEASURE

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

1.7 SHOP DRAWING REVIEW

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

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

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

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

1.8 RESPONSIBILITY

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

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1.9 RESUBMISSION OF SHOP DRAWINGS

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

1.10 WORK MAY PROCEED

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

1.11 BIM MODEL

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

2 SELECTIONS

2.1 CONTACTOR SHOP DRAWING PROCESS

Requirement:	The Main Contractor is to review the shop drawings for errors and omissions prior to on sending to the consultant.
Review Process:	For standard projects allow for a minimum of 10 working days for review by the reviewer. For complex or large projects allow for a minimum of 15 days per review. Additional time will be required of the reviewer is required to review mora than 40 sheets per week, the allotment of additional time is to be agreed between both parties at the onset
Note:	Hand drawn shop drawings will not be accepted. Refer to the below accepted formats

2.2 SHOP DRAWING FORMAT

Requirement:	Submit the shop drawings in the following format
Electronic copy:	PDF A3 Landscape
CAD file:	IFC (Industry Foundation Classes) or DWG (Autocad File Format). Refer to Clause below BIM (Building Information Model) Format

2.3 BIM (BUILDING INFORMATION MODEL) FORMAT

Formats:	IFC (Industry Foundation Classes) RVT (Revit File Format) DWG (Autocad File Format)
Modelling Requirements:	To the minimum requirements as outlined in the New Zealand BIM handbook, specifically Appendix A modelling and documentation best practices (Current Edition)
Level of Development:	To the minimum requirements of LOD 300 as outlined in the New Zealand BIM handbook, specifically Appendix G Level of Development (Current Edition)

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1235S1 SCHEDULE OF SHOP DRAWINGS

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Shop drawings

1.2 SHOP DRAWINGS

Refer to the following sections:

3410 Structural Steel

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

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



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1237 WARRANTIES

1 GENERAL

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

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

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

1.1 SCHEDULE SECTION

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

Warranties

1.2 PROVIDE WARRANTIES

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

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

1.3 WARRANTIES - INSTALLER/APPLICATOR

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

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

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

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Submission

1.5 REVIEW BY CONTRACTOR

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

1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

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

1.7 WARRANTIES - REQUIRED BY CONTRACT

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

1.8 WARRANTIES - SUBMISSION NZS 3902 CONTRACT

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

1.9 WARRANTIES - SUBMISSION NZS 3910 CONTRACT

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

1.10 GUARANTEES - SUBMISSION NZS 3915 CONTRACT

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

1.11 WARRANTIES/GUARANTEES - SUBMISSION NZS 3916 CONTRACT

Refer to NZS 3916 Conditions of contract for building and civil engineering – Design and construct, clauses 11.5 and 11.6 for requirements relating to the time for submission of warranties and guarantees respectively. Submit all warranties/guarantees to the engineer no later than the date that the contractor notifies that it believes the contract works qualify for practical completion.

2 SELECTIONS

Project warranties / guarantees

2.1 CONTRACTUAL WARRANTIES – GENERAL

Form of contract:	Refer to the Project Administrator for Confirmation Generally the New Zealand document Conditions of Contract for Building and Civil Engineering Construction NZS 3910, 3916, 3917 (Current Editions.)
Requirements:	Refer to the Conditions of Contract and or the Project Administrator for any required contractual warranties and confirmation outside the listed warranties/ guarantees under the section

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Guarantees - Contractor - Master Build Services Ltd

2.2 MASTER BUILD SERVICES LTD - 10 YEAR GUARANTEE

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

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

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

Guarantee - Contractor - New Zealand Certified Builders Association

2.4 HALO 10-YEAR RESIDENTIAL GUARANTEE

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

Weathertightness and watertightness warranty

2.5 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

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

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

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

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1237S1 SCHEDULE OF WARRANTIES

1 GENERAL

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Warranties

1.2 WARRANTIES

Refer to the following sections:

3155MR	MAXRaft Floor System
4161	Underlays, Foils & DPC
4161MP	Masons Underlays, Dpm & Dpc
4165DV	Drispace Roof Ventilation & Wall Vented Cavity Batten
4221HV	Hermpac Vertical Weatherboard Cladding System
4231HI	James Hardie External Fire & Acoustic Wall Systems
4231HO	James Hardie® Oblique™ Weatherboard Cladding
4239JH	James Hardie® Soffits
4311SR	Stratco Profiled Metal Roofing
4521AR	APL Residential Aluminium Windows & Doors
4610AG	AGP Glazing Residential
4711EW	Earthwool Glasswool Thermal Insulation
4811	Sealant
5171RI	RCS Integra Lightweight Concrete Intertenancy System
5313KL	Rondo Systems
6221M	Mapei Tiling Solutions
6311FF	Forte Timber Overlay System
6511	Carpeting
7123	Hot & Cold Water System
7352	Type 1 Domestic Smoke Alarm Systems
7411D	Metal Rainwater Spouting Systems
7421AI	Allproof Interior Floor Waste Systems
7556	Solid Fuel Space Heating System
7612	Residential Extract Systems
7673	Heat Pump Systems
7701	Electrical Basic

1.3 PROJECT WARRANTIES

Refer to section 1237 WARRANTIES for project warranties.

1.4 WARRANTIES - ADDITIONAL ITEMS

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

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1237WA WARRANTY AGREEMENT

1 SPECIFICS

1.1 PARTIES TO THE WARRANTY AGREEMENT

Principal:

.....

Contractor:

.....

Warrantor:

.....

1.2 BACKGROUND

The principal has entered into a contract with the contractor for carrying out the contract works. The warranted works / materials are part of the contract works. The contractor has agreed to arrange for the provision of a warranty in respect of the warranted works / materials for the warranty period on the terms set out in this warranty. The warrantor has agreed to provide a warranty in respect of the warranted Works / materials for the warranty period on the terms set out in this warranty agreement.

1.3 LOCATION

Project name:

.....

Project address:

.....

1.4 WARRANTED WORKS

Warranted works:

.....

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

1.5 WARRANTED MATERIALS

Warranted materials:

.....

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

2 WARRANTY TERMS

2.1 WORKS ARE AS REQUIRED IN THE CONTRACT

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

2.2 WARRANTY ADDITIONAL TO OTHER OBLIGATIONS

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

2.3 WARRANTOR TO REMEDY DEFECTS

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



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2.4 CARRYING OUT REMEDIAL WORK / REPLACEMENT OF DEFECTIVE MATERIALS

Any remedial work / replacement of defective materials which the warrantor is liable to undertake / provide under this warranty shall be carried out:

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

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

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

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

2.6 PRINCIPAL SHALL CONSIDER REASONABLE PROPOSALS

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

2.7 FAILURE BY WARRANTOR TO PERFORM REMEDIAL WORK

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

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

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

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

2.8 WARRANTOR NOT LIABLE FOR

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

- Wilful act or negligence of the principal or any person other than the warrantor.
- Fire, explosion, earthquake, war, subsidence, slips, faulty materials or workmanship other than caused by the defect in the warranted work.
- Any force of nature which the warrantor could not have reasonably foreseen.
- Any neglect or unnecessary delay by the principal in giving notice to the warrantor of a defect in the warranted works becoming apparent.
- Design faults, errors or discrepancies, unless the warrantor undertook the design of the part of the warranted works that is the subject of the defect.
- Use of the Warranted Works by the Principal or other person in any manner or for any purpose not being the intended manner of use or purpose of the Warranted Works.
- Failure by the principal or other persons to maintain the warranted works in accordance with good practice and any manufacturer's stated or recommended instructions or requirements.
- Fair wear and tear.

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2.9 WARRANTY MAY BE ASSIGNED

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

2.10 DISPUTES

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

3 SIGNATORIES

3.1 SIGNED BY THE WARRANTOR

....
Signed Date

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

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

3.2 SIGNED BY THE PRINCIPAL

....
Signed Date

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

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

3.3 NOTE

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

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

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

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4 GENERAL CONDITIONS

4.1 CONTRACTUAL WARRANTIES – GENERAL CONDITIONS

Form of contract:	Refer to the Project Administrator for Confirmation Generally the New Zealand document Conditions of Contract for Building and Civil Engineering Construction NZS 3910, 3916, 3917 (Current Editions.)
Requirements:	Refer to the Conditions of Contract and or the Project Administrator for any required contractual warranties and confirmation outside the listed warranties/ guarantees under the section

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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

There are no work section requirements.

1.3 AS BUILT DOCUMENTS - ADDITIONAL ITEMS

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



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1239 OPERATION & MAINTENANCE

1 GENERAL

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

1.1 SCHEDULE SECTION

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

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

Operation and maintenance documents

1.2 OPERATION AND MAINTENANCE INFORMATION - BUILDING ACT

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

1.3 OPERATION AND MAINTENANCE INFORMATION

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

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

1.4 MAINTENANCE REQUIREMENTS

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

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

1.5 APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

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

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

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1.6 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

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

1.7 SELECTIONS INFORMATION

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

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

Include brochures and other information included with the items supplied.

1.8 SELECTIONS INFORMATION - SUBSTITUTIONS

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

Documentation format

1.9 O&M DOCUMENTATION FORMAT

Unless otherwise specified in a work section,

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

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

Submission and review

1.10 O&M DOCUMENTATION SUBMISSION & REVIEW

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

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

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

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

The reviewer may advise that:

- The O&M documentation has been reviewed and has been accepted without the need for further modification. The information can be included in the final documentation; or
- The O&M documentation has been reviewed and the information can be included in the final documentation subject to revision required by notes, annotations or comments provided; or

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- The O&M documentation has been reviewed and is not acceptable, refer to notes, annotations or comments provided. Resubmit corrected/altered documentation for review.

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

Final documentation

1.11 SUBMISSION OF FINAL DOCUMENTATION

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

1.12 FINAL O&M DOCUMENTATION - HARDCOPY

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

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

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

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

1.13 FINAL O&M INFORMATION - ELECTRONIC COPY

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

1.14 REVIEW OF FINAL DOCUMENTATION

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

2 SELECTIONS

O&M Documentation

2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE

Provide a complete electronic copy to the contract administrator.

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

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

2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS

Provide a complete electronic copy to the contract administrator.

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

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

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Maintenance contract proposals

2.3 MAINTENANCE CONTRACT PROPOSALS

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



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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

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

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

4231HI	James Hardie External Fire & Acoustic Wall Systems
4231HO	James Hardie® Oblique™ Weatherboard Cladding
4239JH	James Hardie® Soffits
4311SR	Stratco Profiled Metal Roofing
4521AR	APL Residential Aluminium Windows & Doors
4555	Garage Doors
4610AG	AGP Glazing Residential
6311FF	Forte Timber Overlay System
7123	Hot & Cold Water System
7150	Sanitary Fixtures, Tapware & Accessories.
7352	Type 1 Domestic Smoke Alarm Systems
7411D	Metal Rainwater Spouting Systems
7421AI	Allproof Interior Floor Waste Systems
7556	Solid Fuel Space Heating System
7612	Residential Extract Systems
7673	Heat Pump Systems

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

Refer to the following sections:

7421	Sanitary Systems

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

Refer to the following sections:

7673	Heat Pump Systems

Additional Items

1.5 ADDITIONAL ITEMS

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

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1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

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

Notices and approvals

1.1 STATUTORY OBLIGATIONS

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

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

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

1.3 NOTIFY NETWORK UTILITY OPERATORS

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

Inspections

1.4 CARRY OUT INSPECTIONS

Existing building and adjacent building owners are to be notified of all works and potential impacts from any associated building activities. Refer to the relevant sections for site access and traffic management requirements

Site preparation

1.5 SITE ACCESS

Refer to the traffic management / Control plan in the first instance, otherwise refer to the Project management / client for Access requirements.

1.6 WORKING AREA

Limited to the designated working areas on the site.

1.7 SITE AND SOIL SURVEYS

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

1.8 GROUND CONDITIONS

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

Existing buildings

1.9 ALTERATIONS

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

1.10 TEMPORARY ACCESS

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

1.11 USE OF LIFTS

If lifts are available on site, confirm all access requirements at the time of tender for use by the contractor for worker access and goods deliveries.

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1.12 USE OF STAIRS

If Stairs are available on site, confirm all access requirements at the time of tender for use by the contractor for worker access and where necessary for goods deliveries. Do not leave goods in the stairway as these must remain available for emergency egress. Do not wedge or hold open fire doors or smoke control doors.

Temporary construction

1.13 TEMPORARY BUILDINGS

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

1.14 TEMPORARY SITE FENCING AND OTHER REQUIRMENTS

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.

Provide all required temporary hoardings, gantries, guard rails, security and lighting as necessary and as required to safely to protect the public and site. All aspects are to meet the requirements of the local territorial and or other referring authority.

All locations are to be discussed and co-ordinated with the main contractor prior to the start of any works

1.15 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

1.16 SITE - PROJECT SIGN

Obtain approval to, provide and erect a timber framed sign board 2400mm x 1200mm. Sign to be, fully painted with vinyl lettering or fully printed, and displaying:

- Title of contract
- Principal's name
- Contractor's name
- Consultants

First aid

1.17 FIRST AID EQUIPMENT

Provide first aid equipment.

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1247 TRAFFIC CONTROL

1 GENERAL

This general section relates to temporary on and off site traffic control including:

- Access and egress
- Traffic control and signage
- Deliveries
- Parking
- Vehicle wash down

Access and egress

1.1 TRAFFIC MANAGEMENT PLAN

Refer to the building and resource consents for territorial authority requirements relating to the provision of a traffic management plan. Submit the plan to the contract administrator.

1.2 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.

1.3 FORM TEMPORARY VEHICLE CROSSING

Form a temporary vehicle crossing for use by construction traffic for the duration of the contract. Comply with territorial authority requirements for the construction of temporary vehicle crossings. Ensure the crossing is capable of supporting the heaviest loads to be delivered to the site. Maintain to an acceptable standard until it is no longer required for construction traffic.

1.4 PROTECT EXISTING VEHICLE CROSSING

Provide protection to existing vehicle crossing for use by construction traffic for the duration of the contract. Comply with territorial authority requirements for the construction of temporary protection to the crossing. Ensure the protection is capable of supporting the heaviest loads to be delivered to the site. Maintain to an acceptable standard until it is no longer required for construction traffic. Replace the crossing if the temporary protection has not properly protected the existing crossing.

1.5 PROTECT NEW VEHICLE CROSSING

Provide protection to the new vehicle crossing for use by construction traffic for the duration of the contract. Comply with territorial authority requirements for the construction of temporary protection to the crossing. Ensure the protection is capable of supporting the heaviest loads to be delivered to the site. Maintain to an acceptable standard until it is no longer required for construction traffic. Replace the crossing if the temporary protection has not properly protected the existing crossing.

1.6 CONSTRUCT TEMPORARY ROADS

Construct temporary roads for use by construction traffic for the duration of the contract. Refer to SELECTIONS.

1.7 CONSTRUCT TEMPORARY HARD STANDING

Construct temporary hard standing for use by construction traffic for the duration of the contract. Refer to SELECTIONS.

Traffic control and signage

1.8 TRAFFIC LIGHTS

Provide and maintain traffic light access/egress control. Refer to SELECTIONS.

1.9 STOP / GO CONTROL

Provide stop/go traffic control while carrying out operations where traffic must be controlled while a specific operation is carried out. Refer to SELECTIONS.

1.10 TRAFFIC CONTROL - WORK IN THE ROADWAY

Where temporary works are required to be carried out in the roadway, obtain all required consents and comply with the road network authorities traffic management requirements.

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1.11 TRAFFIC SIGNS - SITE CONSTRUCTION TRAFFIC

Provide signs as required to identify specific temporary requirements for site construction traffic during the construction period. Refer to SELECTIONS.

1.12 TRAFFIC SIGNS - OTHER TRAFFIC

Provide signs as required to identify changes and diversions to non-construction site traffic. Where appropriate use NZTA standard signs including temporary signs as appropriate.

1.13 CONES AND BARRIERS

Provide marker cones and barriers to demark restricted and dangerous areas and for other site safety reasons as required.

Deliveries

1.14 GOODS DELIVERY AREA

Refer to SELECTIONS for goods delivery area. Delivery vehicles that are not able to use the designated delivery area must queue in the designated off site waiting area.

Parking

1.15 PARKING

Refer to SELECTIONS for on site parking areas and parking restrictions.

Completion

1.16 REMOVE TEMPORARY PROTECTION

When no longer required remove temporary protection. Clean and leave in the condition prior to the contract works commencing. Replace surfaces where the protection has not provided the required protection.

1.17 REMOVE TEMPORARY VEHICLE CROSSING

When no longer required remove temporary vehicle crossing and make good as required.

1.18 REMOVE TEMPORARY ROADS

When no longer required remove temporary roads and make good as required.

1.19 REMOVE TEMPORARY HARD STANDING

When no longer required remove temporary hard standing and make good as required.



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2 SELECTIONS

2.1 SITE ACCESS

Location: Refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.2 SITE EGRESS

Location: Refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.3 TIME FOR ACCESS AND EGRESS

Site access and egress is allowed between the following times.

Times: For all requirements refer to the Project administrator for confirmation.

2.4 LIMITATION ON ACCESS AND EGRESS

Site access and egress is not allowed between the following times.

Times: or all requirements refer to the Project administrator for confirmation.

2.5 TEMPORARY VEHICLE CROSSING

Refer drawing: or all requirements refer to the Project administrator for confirmation.

2.6 TEMPORARY ROADS

Requirement: Where required, refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.7 TEMPORARY HARD STANDING

Requirement: Where required, refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.8 TRAFFIC LIGHTS

Where designated under any traffic report and or traffic management plan provide and maintain traffic light access/egress control in accordance with local authorities and the referring standards

2.9 STOP / GO CONTROL

Where designated under any traffic report and or traffic management plan provide and maintain traffic light access/egress control in accordance with local authorities and the referring standards

2.10 TRAFFIC SIGNS - SITE CONSTRUCTION TRAFFIC

0Where designated under any traffic report and or traffic management plan provide and maintain traffic light access/egress control in a0ccordance with local authorities and the referring standards

2.11 GOODS DELIVERY AREA

Requirement: Where required, refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.12 PARKING

Requirement: Where required, refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator

2.13 PARKING RESTRICTIONS

Requirement: Where required, refer to the corresponding site plan sheet drawings and or confirmation from the Project administrator



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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 TEMPORARY ROADS

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

1.5 CONSULTANTS TEMPORARY SITE OFFICE

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

1.6 SITE FENCING

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

Construct the fence with:

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

1.7 SITE FENCING - NON-PUBLIC AREAS

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

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

1.8 SITE HOARDINGS

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

Construct hoardings with continuous cladding of:

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

1.9 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.

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1.10 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

Prevent silt run off by:

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

Provide sediment control by:

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

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

1.11 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.

1.12 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

1.13 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:



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- 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

1.14 OCCUPIED BUILDINGS

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

1.15 PARTITIONS

Provide and maintain full height temporary partitions, dust sealed and with appropriate access doors as and where required or as shown on the drawings / documentation

Construct the partitions from;

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

1.16 SCREENS

Provide and maintain 2.0m high temporary screens with appropriate access doors as and where required or as shown on the drawings / documentation.

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

1.17 DUST SCREENS

Provide and maintain full height temporary dust screens as and where required or as shown on the drawings / documentation.

Construct the screens from;

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

Temporary services

1.18 WATER

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

1.19 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.

1.20 TELEPHONE

Provide on-site temporary telephone facilities.

1.21 COMPUTER FACILITIES

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

1.22 PRINTER

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

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1.23 IMAGING

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

Care and protection - existing buildings

1.24 PROTECT EXISTING BUILDINGS

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

1.25 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.

1.26 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.

1.27 MAKE GOOD - EXISTING BUILDINGS

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

Care and protection - Site

1.28 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.

1.29 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.

1.30 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.

1.31 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.

1.32 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

1.33 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.

1.34 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

1.35 SPECIAL PROTECTION PROJECT

Refer to individual work sections for any special protection and or other requirements.

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Care and protection - miscellaneous

1.36 CONSTRUCTION KEYING AND SECURITY

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

1.37 TEMPORARY STORAGE

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

Rubbish removal

1.38 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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1256 WASTE MANAGEMENT

1 GENERAL

This general section relates to the implementation of a site waste management plan.
It includes:

- **Full REBRI requirements**
- **Part REBRI requirements**

1.1 RELATED WORK

Refer to the drawings and documentation, specifically any requirements around Homestar and or Greenstar 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:

REBRI	Resource Efficiency in the Building and Related Industries

1.3 DOCUMENTS

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

REBRI Contract Specification for Waste Management
REBRI Waste Management Plan
REBRI Waste Transfer Form
REBRI Guides and Resource Recovery Documents (various)

REBRI contact details

Organisation:	REBRI
Web:	www.branz.co.nz/REBRI
Email:	branz@branz.co.nz

Special requirements

1.4 SPECIAL REQUIREMENTS - GENERALLY

Clauses in this section are additional to or modify clauses in other standard sections, particularly those covering demolition. This section should be read in conjunction with the rest of this specification with regard to all waste management for the project.

Refer to the clause RELATED WORK above for the main sections that are affected by this section.

Requirements - part REBRI

1.5 SITE COORDINATOR

The contractor is responsible for instructing and coordinating workers and overseeing and documenting results for REBRI requirements.

1.6 WASTE MANAGEMENT PLAN

Prepare and submit a waste management plan similar to the REBRI Waste Management Plan and REBRI Guides, and to suit the location of the project.

The submitted plan to include the following factors:

- site planning and material storage
- waste management
- purchasing
- recycling
- salvage.

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1.7 REPORTING

Contractor provide a report to the site meeting based on the Waste Management Plan and similar to the Waste Transfer Form, of waste materials, recycled, reused and disposed of by the project.

If requested, submit to the Contract Administrator documentation confirming that all materials have been received at the required locations.

Requirements - General

1.8 ENSURE

Ensure all site management and staff, subcontractors, material and product suppliers and waste disposal companies are made aware that this is a REBRI project (in part or full) and provide access to or copies of the waste management plan.

2 PRODUCTS

Equipment

2.1 CONTAINERS

Provide appropriately sized and sited containers/bins for the storage of reusable, recyclable and waste products. Clearly label each container.

3 EXECUTION

Conditions

3.1 STORAGE

Store all materials so they are not damaged prior to use.

3.2 PLANNING

Plan the measurement and ordering of materials and components to minimise waste.

Statutory requirements

3.3 HAZARDOUS WASTE

Conform to applicable regulations for disposal and removal of common and hazardous waste.

Handle and dispose of all hazardous and banned materials in accordance with national and local regulations - these hazardous and banned materials may include but are not limited to asbestos, underground storage tanks, polychlorinated biphenyls (PCBs), abandoned chemicals (petrol, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors and mercury-containing switches, also contaminated soil or fill.



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4 APPLICATION

4.1 DEMOLITION

- Sort concrete and concrete block waste for recycling as aggregate, sub-base material or fill.
- Sort brick waste for reuse as whole bricks, or re-use as crushed brick for landscape cover, sub-base material or fill.
- Sort asphalt material by type for milling and recycling.

4.2 SITE CLEARING

- Sort asphalt material by type for milling and recycling.
- Grind, chip or shred vegetation for mulching and composting on site.
- Grind, chip or shred vegetation for off site mulching and composting.
- Separate and recycle steel reinforcing and other metals.
- Provide suitable on-site locations for the disposal of excavated rock, soil and vegetation.

4.3 CONCRETE

- Plan for maximum re-use of concrete formwork.
- Separate and recycle concrete.
- Provide a suitable on-site location for the disposal of excess concrete.

4.4 WOOD

- Separate and recycle wood off-cuts and waste.
- Separate timber for reuse
- Provide a suitable storage area for sizeable off-cuts for use as spacers or blocking.
- Separate CCA treated timber from untreated timber.
- Chip untreated timber for mulching and composting on site.
- Chip untreated timber for off site mulching and composting.

4.5 PLASTERBOARD

- Include for both horizontal fitting of sheets and customised sheet lengths.
- Retain larger off-cuts for use around doors, windows or built-in items.
- Waste plasterboard, separate and recycle to compost (if locally available).

4.6 PLUMBING

- Select plumbing materials with a high recycled content.
- Ensure that reusable packaging materials are returned to the vendors.
- Retain PVC off-cuts for use as stubs.
- Separate and recycle plastics.

4.7 ELECTRICAL

- Select electrical materials with a high recycled content.
- Ensure that reusable packaging materials are returned to the vendors.
- Separate and recycle metals and wire.
- Separate and recycle plastics.

4.8 MECHANICAL

- Select mechanical materials with a high recycled content.
- Ensure that reusable packaging materials are returned to the vendors.
- Separate and recycle metals and wire.
- Separate and recycle plastics.

Completion

4.9 CLEANING

All cleaning materials used on the project to be biodegradable and non-toxic.

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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

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

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

This section includes schedules identifying work sections with:

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

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

3102	Concrete Work - Standard
4383	Exterior Timber Decking, Balcony and Steps

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

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

6221M	Mapei Tiling Solutions

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

There are no work section requirements.

1.7 TEST METHODS & MINIMUM TEST VALUES

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

Test condition:	Minimum test value required:	Test method:

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

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

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

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

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

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0.557	1 in 8	7.125°

1.8 GENERAL REPORTING REQUIREMENTS

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

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

Slip resistance - additional items

1.9 SLIP RESISTANCE - ADDITIONAL ITEMS

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

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2242 BACKFILLING

1 GENERAL

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

Related work

1.1 RELATED SECTIONS
Refer to Drawings and all documentation

Documents

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

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

Requirements

1.3 CONTROL TESTING FOR FILLS - NZS 4431
During construction of earth fills undertake required quantitative control tests on the fill material.

1.4 INSPECTION NOTIFICATION - NZS 4431
Notify the inspecting engineer of the times required for inspection.

1.5 INSPECTION NOTIFICATION
Notify the inspecting engineer of the times required for inspection.

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

2 PRODUCTS

Earth fill materials

2.1 EARTH FILL – NOT REQUIRED TO SUPPORT BUILDINGS OR SURFACES
Lower density fills (defined in NZS 4431) as specified/ identified by the inspecting engineer. Refer to SELECTIONS.

2.2 EARTH FILL – RESIDENTIAL DEVELOPMENT
Earth fill material identified as a soil type whose general properties have been determined and confirmed by engineering testing and investigation as being suitable for fill material, as defined in NZS 4431. Refer to SELECTIONS.

Granular fill materials - Specific Design

2.3 GRANULAR FILL MATERIAL – SPECIFIC DESIGN
Refer to SELECTIONS.

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2.4 BLINDING LAYER – SPECIFIC DESIGN
Refer to SELECTIONS.

Granular fill materials - NZS 3604

2.5 GRANULAR FILL MATERIAL – NZS 3604
Comprised of crushed rock or scoria. No more than 5% shall pass through a 2.2mm sieve, with 100% able to pass through a 19 mm sieve for any fill thickness, or a 37.5 mm sieve for a fill thickness exceeding 100 mm.

2.6 BLINDING LAYER FOR POLYTHENE SHEET DPM – NZS 3604
Sand to a nominal minimum thickness of 5 mm, with a maximum compacted thickness of 25 mm.

Concrete pavements

2.7 SUBGRADE - CONCRETE PAVEMENTS
Refer to SELECTIONS.

2.8 SUBBASE - CONCRETE PAVEMENTS
Refer to SELECTIONS.

Dressing course

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

Site concrete

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

Flowable material

2.11 FLOWABLE MATERIALS
Refer to SELECTIONS.

Service trench backfill material

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

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

2.14 ORDINARY FILL
Use material previously excavated from the trench.

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

2.16 BEDDING & SURROUND – WATER PIPES
Sand.

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

2.18 MARKING TAPE
Marking tape, refer to SELECTIONS

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Drainage materials

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

2.20 NO FINES DRAINAGE METAL
GAP metals with the fines washed out. Refer to SELECTIONS.

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

2.22 NO FINES CONCRETE
Single-sized coarse aggregate without fines material, bound together with a cement paste to achieve a specified void content. Refer to SELECTIONS.

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

Geotextile Fabric

2.24 GEOTEXTILE FABRIC
Geotextile fabric. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 UNSUITABLE MATERIALS
Remove from site all unsuitable filling material.

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

3.3 SPREAD SURPLUS
Spread and level surplus imported filling materials where directed.

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

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

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

3.7 EARTHMOVING EQUIPMENT
Do not use earthmoving equipment for compaction.

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

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

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

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Application - Earth fill materials

3.10 SITE PREPARATION - NZS 4431

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

3.11 FILL PLACING - NZS 4431

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

3.12 FILL COMPACTION - NZS 4431

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

Application - Granular fill material

3.13 SPREAD AND COMPACT GRANULAR FILL - GENERAL

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

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

3.14 SPREAD AND COMPACT GRANULAR FILL - NZS 3604

Place granular fill in layers of 150mm maximum thickness. Compact each layer until the fill is tightly bound together and does not deform under the weight of a pressed adult heel.

Compact with a vibrating plate compactor for small areas and in confined shapes, compact with a vibrating roller for large areas.

3.15 SPREAD AND COMPACT GRANULAR FILL - NZS 4229

Place granular fill in layers between 100 to 150 mm thick. Compact with a vibrating plate compactor for small areas and in confined shapes, compact with a vibrating roller for large areas.

3.16 SAND BLIND SURFACE

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

3.17 AP 7 BLIND SURFACE

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

Application - Service trench backfill

3.18 GRANULAR BEDDING– FOUL WATER & SURFACE WATER PIPES

Place granular bedding in layers no greater than 100mm loose thickness. Compact by tamping by hand using a rod with a pad foot (having an area 75 ± 25mm by 75 ± 25mm) over the entire surface of each layer to produce a compact layer without obvious voids.

3.19 GRANULAR BEDDING AND SURROUND – FOUL WATER & SURFACE WATER PIPES

Place granular bedding and surround in layers no greater than 100mm loose thickness and compact by tamping by hand using a rod with a pad foot (having an area 75 ± 25mm by 75 ± 25mm) over the entire surface of each layer to produce a compact layer without obvious voids.

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3.20 COMPACTED SELECTED FILL – FOUL WATER & SURFACE WATER PIPES

Place selected fill in layers no greater than 100mm loose thickness and compact. Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area 75 ± 25mm by 75 ± 25mm) over the entire surface of each layer to produce a compact layer without obvious voids. For selected fill more than 300mm above the pipe compact layers with at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75kg.

3.21 ORDINARY FILL – FOUL WATER & SURFACE WATER PIPES

Place ordinary fill in layers no greater than 100mm

3.22 BEDDING AND BACKFILL – COLD WATER PIPES

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

3.23 BEDDING AND BACKFILL – COLD WATER PIPES BENEATH CONCRETE SLABS

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

3.24 MARKING TAPE

Install marking tape at required level during backfilling process.

Application - Geotextile Fabric

3.25 GEOTEXTILE FABRIC

Install geotextile fabric to manufacturer's requirements.

Application - Retaining wall backfill

3.26 PROTECT RETAINING WALL TANKING

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

3.27 BACKFILL TO RETAINING WALLS

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

3.28 BACKFILL TO RETAINING WALL - NZS 4229

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

3.29 BACKFILL TO RETAINING WALLS - NZCMM section 6.1

Place granular fill in layers not exceeding 150 mm thick loose depth. 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.

Completion

3.30 LEVELLING POINTS - NZS 4431

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

3.31 TAKE AWAY

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

3.32 LEAVE

Leave work to the standard required by following procedures.

3.33 REMOVE

Remove all debris and unused materials from the site.

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4 SELECTIONS

Earth fill

4.1 EARTH FILL – NOT REQUIRED TO SUPPORT BUILDINGS OR SURFACES

Location: Refer to the civil and structural plans and documentation as required for all recommendations

Type: If not specifically addressed by the civil drawings and documentation the minimum requirement is to be Low density fill for areas not required to support structures or surfaces

Hardfill

4.2 HARDFILL - REFER ENG. DRAWINGS

Location: Refer to the civil and structural plans and documentation as required for all recommendations

Type: Refer to the civil and structural plans and documentation as required for all recommendations

Blinding layer

4.3 BLINDING LAYER - REFER ENG. DRAWINGS

Location: Refer to the civil and structural plans and documentation as required for all recommendations

Type: Refer to the civil and structural plans and documentation as required for all recommendations

Concrete pavements

4.4 SUBGRADE - REFER ENG. DRAWINGS

Location: Refer to the civil and structural plans and documentation as required for all recommendations

Type: Refer to the civil plans and documentation as required for all recommendations

Service trench backfill material

4.5 SERVICE TRENCH - GRANULAR BEDDING

Location: Refer to the architectural, site, civil plans and documentation as required

Type: Refer to the civil plans and documentation as required for all recommendations

4.6 SERVICE TRENCH - GRANULAR BEDDING AND SURROUND

Location: Refer to the architectural, site, civil plans and documentation as required

Type: Refer to the civil and structural plans and documentation as required for all recommendations

4.7 SERVICE TRENCH - ORDINARY FILL

Location: Refer to the architectural, site, civil plans and documentation as required

Type: Refer to the civil and structural plans and documentation as required for all recommendations

4.8 SERVICE TRENCH - COMPACTED SELECTED FILL

Location: Refer to the architectural, site, civil plans and documentation as required

Type: Refer to the civil and structural plans and documentation as required for all recommendations



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4.9 BEDDING & SURROUND – COLD WATER PIPES

Location:	Refer to the architectural, site, civil plans and documentation as required
Type:	Refer to the civil and structural plans and documentation as required for all recommendations, If not specifically addressed by the civil drawings and documentation, the minimum requirement is to be Sand

4.10 BACKFILL – COLD WATER PIPES

Location:	Refer to the architectural, site, civil plans and documentation as required
Type:	Refer to the civil and structural plans and documentation as required for all recommendations. If not specifically addressed by the civil drawings and documentation, the minimum requirement is to be Backfill free from organic matter, rock and other hard matter, containing no soil lumps larger than 75mm.

Marking Tape

4.11 MARKING TAPE

Location:	As and where required by standard, statutory and or compliance requirements
Type:	Non-detectable

Drainage materials

4.12 FREE DRAINING HARDFILL - REFER ENG. DRAWINGS

Location:	Where and as required refer to the civil plans and documentation
Type:	Free draining imported hardfill to NZTA F2 specification.

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3102 CONCRETE WORK - STANDARD

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

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

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Requirements

1.3 QUALIFICATIONS

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

Performance

1.4 TESTING

Carry out sampling and concrete acceptance tests during construction to NZS 3109.9. **Concrete acceptance tests during construction**. Conduct 7 day strength tests. After a 7 day test result of less than 60% of the specified strength, stop concrete placement until it is shown that the suspect concrete compiles with the specification.

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

1.5 STEEL REINFORCING COMPLIANCE

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

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

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

1.6 QUALITY ASSURANCE

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

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

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

1.7 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

2 PRODUCTS

Materials

2.1 CEMENT

Portland cement to NZS 3122.

2.2 CEMENT, FILLER

Portland limestone filler cement to NZS 3125.

2.3 SAND

To NZS 3121.

2.4 COARSE AGGREGATE, NORMAL CONCRETE

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

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2.5 WATER

To NZS 3121.

Concrete

2.6 NORMAL CONCRETE

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

2.7 SITE CONCRETE

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

Reinforcement

2.8 GRADE 300E STEEL

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

2.9 GRADE 500E STEEL

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

2.10 WELDED WIRE FABRIC

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

2.11 MESH FOR SLABS TO NZS 3604 OR NZS 4229

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

2.12 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.13 SPACERS AND CHAIRS

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

2.14 TIMBER BOARDS

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

2.15 TIMBER FALSEWORK

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

2.16 RELEASE AGENT

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

Damp proof membrane

2.17 DAMP-PROOF MEMBRANE

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

Accessories

2.18 CELLULAR POLYSTYRENE INSULATION

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

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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.

Fix formwork

3.2 LOADINGS

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

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

3.3 PROVIDE ALL FORMWORK

Provide all formwork necessary to support and confine the concrete and shape it to the required dimensions. Fabricate in a manner permitting its easy removal without damage to the concrete.

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

3.4 FALSEWORK

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

3.5 ACCURACY

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

3.6 TOLERANCES OF CONCRETE SURFACE FINISHES

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

3.7 EXPOSED CONCRETE

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

3.8 JOINTS IN FORMS

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

3.9 CAMBERS

Cambers shown on the drawings or specified, relate to the concrete immediately before formwork is struck. Unless otherwise shown on drawings, construct forms to achieve the following:

- maximum deflection of face materials between strutting: 1/240th of span, but not exceeding 6mm.
- maximum deflection of beams: 1/900th of span
- maximum deflection of cantilevers supporting construction loads: 1/300th of cantilever length.

3.10 STRIKING FORMWORK

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

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Install insulation

3.11 INSTALL UNDERSLAB POLYSTYRENE INSULATION

Install polystyrene insulation system to manufacturer's requirements.

Install reinforcing

3.12 CUT AND BEND

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

3.13 ADJUSTMENTS

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

3.14 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.15 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**.

3.16 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).

3.17 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

3.18 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

3.19 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.

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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.

3.20 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with

NZS 3109, 5.6, Type B.

Place concrete

3.21 PRE-PLACEMENT INSPECTION

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

3.22 UNFAVOURABLE CONDITIONS

Do not place concrete in high winds or other unfavourable conditions. Refer to NZS 3109: 7.2 Unfavourable conditions, for when concrete may not be placed. Remove and make good concrete damaged by frost, dry and wet conditions.

3.23 PROTECT CONCRETE WORK

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

3.24 TRANSPORT CONCRETE

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

3.25 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.

3.26 PLACE CONCRETE

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

3.27 COMPACT CONCRETE

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

3.28 VIBRATORS

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

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Floor slabs

3.29 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3. Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 3.0 **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, 3.1.13 **NZS 3604 New clause**.

Finishing

3.30 SCREED THE SURFACE

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

3.31 SURFACE FINISHES

To NZS 3114, 105, **Specification of finishes**, for off the form finishes and to NZS 3114, Part 3, **Floors, exterior pavements, and inverts**, for slabs and pavements. Refer SELECTIONS.

3.32 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 20 ºC).

3.33 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. Where saw cuts are to be made, cut out 100mm of every second wire of the mesh for a length of 50mm each side of the saw cut position. Saw cuts: 1/3rd slab depth or 30mm minimum

3.34 SPACING OF SAW CUTS

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

Curing

3.35 CURING PERIOD

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

3.36 CURING METHOD

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

- Ponding
- Sprinkling
- Wet coverings
- Plastic sheet
- Curing compound

3.37 KEEP ABSORBENT FORMWORK MOIST

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

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3.38 SECURE COVERINGS

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

3.39 COLD WEATHER

Do not use coverings employing water at times of freezing weather.

Protect

3.40 PROTECT PLASTIC CONCRETE

Protect plastic concrete from indentation and surface marking.

3.41 PROTECT HARDENED CONCRETE

Protect surfaces of stripped concrete from damage especially at arrises.

3.42 PROTECT EXPOSED SURFACES

Protect from rust marks and other surface disfigurements.

Defects

3.43 DEFECTS

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

3.44 SURFACE DEFECTS

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

Completion

3.45 CLEAN OUT

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

3.46 REMOVE

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

4 SELECTIONS

4.1 LOCATION OF CONSTRUCTION JOINTS

Note: Refer to the structural drawings and documentation, allow to coordinate with the architectural plans as required

4.2 REINFORCEMENT LAPS

Note: Refer to the structural drawings and documentation



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Concrete General- where not nominated by the civil / structural engineer the minimal requirements are as per the below

4.3 CONCRETE - PEDESTRIAN PATHS

Location:	Refer to the civil and Landscape drawings / Hardscape plan, coordinate with the architectural plans as required
General Note:	**Where not nominated by the civil/ structural engineer the minimal requirements are as per the below**
Type:	Unit pathways or service and utility areas (only to the Units)
Basecourse thickness:	100mm minimum
Concrete thickness :	75mm minimum - also refer to the current Ed. of the KO-459
Concrete grade Zone B:	17.5 MPa for Zone B
Concrete grade Zone C:	20 MPa: for reinforced concrete exposed to weather, Zone C.
Concrete grade Zone D:	25 MPa: for reinforced concrete exposed to weather, Zone D.
Reinforcement:	Not generally required
Finish:	Brush Finish (class 5 or 6) to meet the requirements of NZBC D1 table 2
Add to mix:	Refer to Exterior Finishes Schedule for any requirements (specifically the Landscape plans)
Kerb:	Have a 100mm-high kerb adjacent to a driveway. Paths between the street and house entry, washing lines, and rubbish/recycling receptacles are 1.2m-wide.
General:	Where pathways have a fall-height greater than 20mm to a lower-level, there is a wheel-stop.

4.4 CONCRETE - PATIOS

Location:	Refer to the civil and Landscape drawings / Hardscape plan, coordinate with the architectural plans as required
General Note:	**Where not nominated by the civil/ structural engineer the minimal requirements are as per the below**
Type:	Terraces and Patios (only to the Units)
Basecourse thickness:	100mm minimum
Concrete thickness :	100mm minimum - also refer to the current Ed. of the KO-459
Concrete grade:	17.5 MPa for Zone B 20 MPa: for Zone C. 25 MPa: for Zone D.
Reinforcement:	665 mesh central or equivalent
Finish:	Brush Finish (class 5 or 6) to meet the requirements of NZBC D1 table 2
Aggregate:	Standard Aggregate
Add to mix:	Refer to Exterior Finishes Schedule for any requirements (specifically the Landscape plans)
General:	Where pathways have a fall-height greater than 20mm to a lower-level, there is a wheel-stop.

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4.5 CONCRETE - SITE

Location:	Refer to the civil and Landscape drawings / Hardscape plan, coordinate with the architectural plans as required
General Note:	**Where not nominated by the civil/ structural engineer the minimal requirements are as per the below**
Type:	Shed Slabs and the like
Basecourse thickness:	100mm minimum
Concrete thickness :	100mm minimum
Concrete grade:	17.5 MPa for Zone B 20 MPa: for Zone C. 25 MPa: for Zone D.
Reinforcement:	665 mesh central or equivalent
Finish:	Brush Finish (class 5 or 6) to meet the requirements of NZBC D1 table 2
Aggregate:	Standard Aggregate
Add to mix:	Refer to Exterior Finishes Schedule for any requirements (specifically the Landscape plans)

4.6 GROUT

Driveways / Joals

4.7 CONCRETE - DRIVEWAY

Location:	Refer to the civil drawings and documentation, coordinate with the architectural plans as required

Ramps / Steps

4.8 CONCRETE - STEPS

Location:	Refer to the civil and Landscape drawings / Hardscape plan, coordinate with the architectural plans as required
General Note:	**Where not nominated by the civil/ structural engineer the minimal requirements are as per the below**
Dimensions:	The contractor is to allow for external concrete ‘non slip’ external steps - max rise: 150mm & min tread depth 310mm.
Concrete thickness :	100mm Min
Concrete grade:	17.5 MPa for Zone B 20 MPa: for reinforced concrete exposed to weather, Zone C. 25 MPa: for reinforced concrete exposed to weather, Zone D.
Finish:	Brush Finish (class 5 or 6) to meet the requirements of NZBC D1 table 2
Add to mix:	Refer to Exterior Finishes Schedule for any requirements (specifically the Landscape plans)
Handrail:	KO-459 H3.2 Access Friendly graspable hand-rail to comply with NZBC D1 Clause 6.0 and figure 26 Handrail Profiles and Clearances. Suitably fix with HD Galv. coach bolts or recessed M12 bolts in accordance with NZS 3604. Suitably cut any exposed thread to stop snagging
Handrail Posts:	100x100 H4 dressed posts with suitable foundations to NZS3604 .1200mm ctrs Max or to suit layout ,the tops should be sloped to suit handrail set out / water shedding
Width:	Minimum clear-width of 1.2m
Non-Slip:	Steps should have a non-slip finish. Brush Finish (class 5 or 6) to meet the requirements of NZBC D1 table 2

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Surface Finish

4.9 CONCRETE STRUCTURAL SLAB - REFER ENG. DRAWINGS

Finish class	Where not specified within the structural documentation, the minimum requirements are to Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.
U3	Floors to be finished with vinyl, tiles or carpet

4.10 CONCRETE FOUNDATION - REFER ENG. DRAWINGS

Finish class	Where not specified within the structural documentation, the minimum requirements are to Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.
U3	Floors to be finished with vinyl, tiles or carpet

4.11 SURFACE FINISHES FOR FLOOR SLABS

Finish class	Where not specified within the structural documentation, the minimum requirements are to Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.
U3	Floors to be finished with vinyl, tiles or carpet

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3155MR MAXRAFT® FLOOR SYSTEM

1 GENERAL

This section relates to the MAXRaft® floor systems.
It includes:

- MAXSlab®

1.1 RELATED WORK

Refer to 2221 REMOVING VEGETATION for clearing site.

Refer to 2241 EXCAVATION for excavation.
Refer to 2242 BACKFILLING for blinding.
Refer to 3102 CONCRETE WORK for formwork, concrete and reinforcing.

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:

EPS	Expanded Polystyrene

Documents

1.3 DOCUMENTS

ocuments referred to in this section are:

NZBC B1/VM1	Structural design of buildings
NZBC B1/AS1	Structural provisions for buildings
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
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
NZS 4431	Engineered fill construction for lightweight structures
AS/NZS 4671	Steel reinforcing materials

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

MAXEdge® Pre-coated Information Sheet
MAXRaft® Product Guide
MAXSlab® / MAXRaft® Brochure
MAXSlab® / MAXRaft® Durability Statement
MAXSlab® / MAXRaft® Installation Manual
MAXSlab® / MAXRaft® Technical Details
MAXSlab® / MAXRaft® Thermal Performance - compiled by Sustainable Engineering Ltd
Enviro Square Kapo Board Technical & Installation Manual
BRANZ Appraisal 1054 (2024) MAXRaft® Concrete Slab Floor System
BPIR MAX85
BPIR MAXRaft
BPIR MAXRaft+
BPIR MAXSlab

Manufacturer/supplier contact details

Company:	MBSS Limited

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Trading as: MAXRaft®
Web: www.maxraft.co.nz
Email: hello@maxraft.co.nz
Telephone: 0800 MAXRAFT (629 723)

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For Pre-coated MAXEdge®

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer / supplier warranty
- Producer Statement PS3 - Construction from the applicator / installer
- Producer Statement PS4 - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Quality control and assurance

1.9 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to AS/NZS 4671. Refer to 3102 CONCRETE WORK for details.

1.10 INSPECTIONS

As specified in PS1 Schedule of Inspections by MAXRaft® Engineer.

1.11 POST-CUT INSPECTION

Inspect and confirm that the soil conditions are as anticipated by the geotechnical investigation and report and conform to the requirements of the MAXSlab® / MAXRaft® Installation Manual.

2 PRODUCTS

MAXRaft® Systems

2.1 MAXSLAB®

MAXSlab® 300/350/400mm thick insulated concrete floor system with 50mm VH EPS under thickenings and S grade insulation underslab. Suitable for good ground conditions or classified as TC1.

2.2 MAXEDGE®

MAXEdge® L shaped perimeter edge footing insulation system. Used for all MAXRaft systems. Available uncoated or pre-coated in 2.4m lengths and in a range of standard heights and widths. Pre-made 600x600mm corners available. Pre-coated MAXEdge® has a 2mm thick, resin based coating system and is UV resistant and waterproof.

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Materials

2.3 BLINDING

25mm compacted GAP 7. Refer to 2242 BACKFILLING.

2.4 TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to NZS 3631.

Refer to MAXRaft® Onsite Guide, and 3102 CONCRETE WORK.

2.5 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to NZS 3604: clause 7.5.4, Damp-proof membrane (DPM).

2.6 POLYSTYRENE SHEETS - MAXSLAB®

MAXSlab® purpose made, NZ made, CFC free, Grade S, expanded polystyrene (EPS) sheets.

2.7 POLYSTYRENE EDGE INSULATION - MAXEDGE®

MAXEdge® purpose made, NZ made, CFC free, Grade VH, expanded polystyrene (EPS), L shaped perimeter edge footing in 2.4m lengths and with 600x600mm external corners. Available either pre-coated with a 2mm thick resin based coating system or uncoated. The pre-coated MAXEdge® is UV resistant and waterproof.

2.8 POLYSTYRENE INTERNAL CONCRETE FOOTING INSULATION

MAXRaft® Systems, NZ made, CFC free, Grade VH, expanded polystyrene (EPS) insulation for internal concrete thickening ribs.

2.9 REINFORCEMENT

Bars to AS/NZS 4671. Grade 500E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Refer to 3102 CONCRETE WORK.

2.10 INTERNAL CORNER REINFORCEMENT

Minimum 2 x D10 bars Grade 300E to AS/NZS 4671.

2.11 MESH

Welded reinforcing mesh to AS/NZS 4671, Class E, minimum to NZBC B1/AS1 - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction). Minimum SE62 500E mesh or equivalent. Refer to 3102 CONCRETE WORK.

2.12 CONCRETE

20 MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size. Refer to 3102 CONCRETE WORK.

Components

2.13 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.14 BAR CHAIRS

MAXRaft® proprietary barchairs.

2.15 POLYCOTE WANZ BAR - SLAB EDGE REBATE

Proprietary EPS insert coated in resin with aggregates to match cladding for covering WANZ bar at perimeter slab edge rebates.

Finish

2.16 PLASTER - SLAB EDGE

Proprietary plaster system to provide UV protection and waterproofing of perimeter slab edge. Refer to relevant plaster and painting section for details.



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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.

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.4 SITE CLEARANCE

Refer to 2221 REMOVING VEGETATION.

3.5 BUILDING PLATFORM

To NZS 4431. Create a building platform to a level surface in accordance with MAXRaft® / project engineers requirements. Cut and/or fill sloping sites. Confirm finished floor level. Ensure building platform is prepared as designed and specified by MAXRaft® engineer. Refer to MAXSlab® /MAXRaft® Systems Technical Details and 2241 EXCAVATION.

3.6 TEMPORARY BUILDING PLATFORM DRAINAGE

Divert existing drainage or construct suitable drainage to keep excessive ground water off the building platform during and after construction as required. Refer to 2241 EXCAVATION.

3.7 HARDFILL

Place hardfill and ensure it is spread and compacted with mechanical compaction. Ensure hardfill is prepared as designed and specified by MAXRaft® or project engineer. Refer to 2242 BACKFILLING.

3.8 UNDERGROUND SERVICES

Ensure underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and in accordance with MAXRaft® requirements, and MAXSlab® /MAXRaft® Installation Manual.

3.9 BLINDING LAYER

Spread GAP 7 blinding layer to a minimum 800mm past the outside edge of the slab, compact to a level layer no greater than 50mm thick and no higher than 250mm below finished ground level.

3.10 FORMWORK

Construct formwork in accordance with MAXSlab® /MAXRaft® Installation Manual and 3102 CONCRETE WORK. Ensure formwork will provide for the topping depth, including rebates and the required concrete finish.

3.11 INSTALL DAMP-PROOF MEMBRANE

Install DPM to the prepared basecourse extending to the outside of all edge beams or fold and staple up the inside of the formwork. Overlap all joints in the DPM sheets a minimum 150mm. Tape laps and penetrations with 50mm wide pressure sensitive plastic tape. Ensure DPM is not damaged during the construction process. Repair all damage to DPM before proceeding with following procedures.

3.12 PLACE POLYSTYRENE - MAXEDGE®

Place polystyrene in accordance with MAXEdge® Information Sheet, MAXSlab® /MAXRaft® System Installation Manual and as per the MAXSlab® /MAXRaft® Panel plan. Place MAXEdge® polystyrene to sit inside the formwork around slab edge prior to installation of other polystyrene.

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Cut holes for services and trim around piles as required on site. Cut polystyrene on site with a saw or suitable hot wire away from the building footprint. Apply expanding foam to gaps, joins and rebates elsewhere prior to and after concrete pour.

3.13 PROTECT - PRE-COATED MAXEDGE®

Prior to the concrete pour, apply tape, silicon or expanding foam to top of insulation to stop slurry between formwork and the pre-coated MAXEdge® insulation.

3.14 INSTALL BARCHAIRS

Form standard ribs between pods using 120mm MAXSlab® /MAXRaft® System Rib Insulation. Place the barchairs at a minimum of one barchair along each edge of each pod or part pod. The ribs in both directions form a waffle pattern throughout the slab.

The MAXSlab® /MAXRaft® System perimeter footings form the edge beam. Place the barchairs at 1200mm centres maximum along the perimeter of the slab at least and one spacer per pod or part pod.

Form ribs to support load bearing walls using MAXSlab® /MAXRaft® polystyrene as specified in the panel plan and engineering. Place the barchairs at a minimum of one spacer along the edge of each pod or part pod.

3.15 PLACE REINFORCING STEEL

Place reinforcing bars floor system to MAXRaft® requirements and NZS 3109, and as documented by the consulting structural engineer.

3.16 LAPPED SPLICES

Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109: 3.7, **Splices in reinforcement**. Plain bars lapped splices must be hooked.

3.17 PLACE REINFORCING MESH AND CHAIRS

Place reinforcing mesh over the polystyrene base sheets and support on the mesh chairs spaced at 1200mm centres minimum.

3.18 MESH LAPS

To NZS 3604 or NZS 4229. Welded reinforcing mesh to be lapped and tied, 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.

3.19 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings.

Waterproof the rebate with a bituminous sealer on both the vertical and horizontal faces. Amend if using NZS 4230.

3.20 TOPPING SLAB DEPTH

Generally 100mm minimum, except MAX85® with 85mm minimum.

3.21 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.

3.22 CONCRETE PLACEMENT AND COMPACTION

Ensure the rib and edge beam canals are clean, free of debris. Lay concrete to NZS 3109. Pour the floor in a single pour ensuring that the pods remain in position during placing. Pour concrete onto the top of each pod prior to filling the ribs around the pod to help prevent them from floating and lifting. Refer to MAXSlab® /MAXRaft® Installation Manual and 3102 CONCRETE WORK.

Compact concrete using a suitable poker vibrator for the ribs and ground beams and into all corners of the formwork. Screed as required. Confirm levels with a laser level.

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3.23 CONCRETE FINISHING

Float and trowel to provide a U3 finish to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.

3.24 CONCRETE CURING

Curing of the concrete slab must take place immediately after finishing the concrete to NZS 3109 by one of the following curing methods:

- ponding or continuous sprinkling of water
- placing a wet covering or plastic membrane over the slab
- the use of liquid membrane curing compounds

3.25 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints in accordance with the MAXSlab® /MAXRaft® Installation Manual and as shown on the plans after hardening to a minimum depth of 25mm within 24 hours in summer, or 48 hours in winter.

Where shrinkage control joints have not been shown on the plans, position the shrinkage control joints to coincide with major changes in the floor plan. Agree position of shrinkage control joints with the designer.

Bay dimensions formed by the shrinkage control joints to be limited to a maximum ratio of length to width of 2 to 1 with a maximum dimension of 6 metres. Place the shrinkage control joints over the 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide loadbearing rib, locate the cut directly above one edge of the 300mm rib. Do not place supplementary reinforcing bars (including re-entrant corner steel) across any shrinkage control joints.

3.26 PRE-COATED MAXEDGE® - TOUCH UP

Repair imperfections with Pre-coat Touch up.

3.27 PRE-COATED MAXEDGE® - PAINT

Refer to appropriate PAINTING section.

3.28 UNCOATED MAXEDGE® - PLASTER & PAINT

Refer to appropriate plastering and painting sections.

3.29 REBATE FINISHING

Install Polycote WANZ bar covers to pre-coated MAXEdge® at rebates supporting inserts.

3.30 STRIKE FORMWORK

Strike formwork after at least 12 hours after the slab has been finished without damaging or overloading structure.

3.31 SURFACE DEFECTS

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

3.32 CLEAN OUT SHRINKAGE CONTROL JOINTS

Clean out control joints. If required fill with suitable flexible sealant.

3.33 WATERPROOFING EXTERIOR OPENINGS

Apply a waterproofing of unreinforced wet area membrane to AS/NZS 4858 for waterproofing around openings for doors, meters and other services openings at floor level. Do not use bituminous coatings.

Completion & Commissioning

3.34 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements. Obtain the Certificate of Compliance issued by MAXRaft® on completion of the project and provide a copy to the contract administrator.

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4 SELECTIONS

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

Materials

4.1 MAXSLAB® - REFER STRUCTURAL ENG.

Brand:	MAXSlab®
Overall depth:	Refer structural engineer
Slab thickness:	Refer structural engineer
Edge:	MAXEdge® - VH EPS insulation
Construction R-value:	Refer H1 report. Determined in accordance with NZBC H1/VM1 Appendix E

4.2 UNCOATED MAXEDGE® - PLASTERED AND PAINTED

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	Standard heights of 300/305/320/340/400/420mm.
Finish:	Plaster and then paint. Refer to appropriate PLASTER and PAINTING section. Recommended options include: Beccrete fibre-reinforce and waterproof plaster coating system Specialised – Tankit Penetration Waterproofing system.Specialised – Tankit Penetration Waterproofing system. Specialized - Tankit Penetration Waterproofing system StoMiral Plaster System Dulux Acratex Two coats acrylic paint

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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 the structural drawings and documentation

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

1.3 DOCUMENTS

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

NZBC F5/AS1	Construction and demolition hazards
AS 1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
AS 1111.2	ISO metric hexagon bolts and screws - Product grade C - Screws
AS 1112.1	ISO metric hexagon nuts - Style 1 - Product grades A and B
AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS 1554.2	Structural steel welding - Stud welding (steel studs to steel)
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
AS/NZS 1554.4	Structural steel welding - Welding of high strength quenched and tempered steels
AS/NZS 1554.5	Structural steel welding - Welding of steel structures subject to high levels of fatigue loading
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2312.2	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 2: Hot dip galvanizing
AS/NZS 2312.3	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 3: Thermal metal stray coatings
NZS 3404.1	Steel Structures Standard
AS 3597	Structural and pressure vessel steel - Quenched and tempered plate
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections

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

Requirements

1.4 QUALIFICATIONS

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

1.5 TOLERANCES

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

1.6 SHOP DRAWINGS

Generally to AS/NZS 5131, 4.4.

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

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

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

Submit shop drawings for review:

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

1.7 VERIFY DETAILS AND DIMENSIONS

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

1.8 TESTS

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

- Welds: Non-destructive examinations (NDE)

1.9 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

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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.

3.7 TEMPORARY MEMBERS FOR GALVANIZED ELEMENTS

Provide temporary members, as required, to strengthen prefabricated elements likely to be distorted by the subsequent hot dip galvanizing process. Co-ordinate, with the galvanizer, the details of any temporary members required.

Welding

3.8 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.

3.9 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.

3.10 WELDING GALVANIZED OR THERMAL SPRAYED STEEL

When welding already Galvanized steel or Thermal Sprayed steel either:

- remove coating locally and carry out a standard weld
- leave coating and adjust welding technique to those recommended in GANZ After-Fabrication Hot Dip Galvanizing document. (Among other things, this will generally mean a slower welding speed.)

Final weld shall meet all the standards and requirements of a standard weld.

Mechanical fastening

3.11 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.

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3.12 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.

3.13 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

3.14 ERECTION GENERALLY

To AS/NZS 5131, Section 11.

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

3.15 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.

3.16 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.

3.17 SITE WORK

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

3.18 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.

3.19 DRIFTING

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

3.20 INSTALLATION OF PURLINS AND GIRTS

Provide trimming members to support edges of roof sheeting along hips, valleys and roof/wall penetrations etc.

3.21 EARTHING STRUCTURAL STEEL

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

Finishing - galvanizing

3.22 GALVANIZING - SEPARATE SECTION

Refer to the separate section 6781 HOT DIP GALVANIZING for galvanizing requirements.

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3.23 STEELWORK BEING GALVANIZED

Fabricator to provide any temporary members required by the galvanizer to strengthen prefabricated elements likely to be distorted by the subsequent hot dip galvanizing process.

Abrasive blast clean to AS 1627.4, class 2.5.
To galvanize, clean sections thoroughly and apply zinc coating by the hot-dip process to the requirements of AS/NZS 4680. Zinc coating thickness not less than AS/NZS 4680, Table 1 and Table 2

3.24 REPAIR WELD DAMAGED GALVANIZING

Remove welding slag, power tool clean, grind off all burrs and sharp arrises, all repairs to AS/NZS 4680, 8.4 **Site repair**:

- Small repairs:- Colour matched zinc rich paint.
- Large repairs:- With approval, colour matched zinc rich paint or other agreed option.

3.25 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.

3.26 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.

3.27 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

3.28 PROTECTIVE COATINGS - SEPARATE SECTION

Refer to the separate section 6745 PROTECTIVE COATINGS - STEELWORK for protective coating requirements .

3.29 PAINTING - SEPARATE SECTION

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

3.30 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.

3.31 PRIMING GENERALLY

Coat steelwork, unless specifically noted otherwise, with the specified priming paint, including patch priming on site after erection.

3.32 PATCH PRIMING

Clean areas of damaged priming and areas left clear for site jointing to a standard comparable with that specified for shop cleaning. Wash off chemical deposits from welding fumes. Apply priming coats to the same standard as shop primers, ensuring thorough coating of bolts, nuts and connection areas. Reprime if more than 4 weeks elapse before the final coating system is applied.

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3.33 COATING SYSTEMS

Apply all coatings in accordance with the coating manufacturer's requirements. Apply coatings to steel within 4 hours of cleaning and before condensation or light rusting can occur. Ensure steel is dry and atmospheric conditions warm and dry, with an air temperature of greater than 12°C and relative humidity less than 85%.

3.34 TOUCH-UP

Touch up primer. Apply protective coatings as specified.

Finishing - fire rated coatings

3.35 FIRE RATED COATINGS - SEPARATE SECTION

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

3.36 FIRE RATED COATINGS - MANUFACTURERS REQUIREMENTS

Refer to the separate manufacturers information for rated coating requirements.

3.37 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.38 COMPLETION MATTERS

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

4 SELECTIONS

Steel Sections

4.1 STEEL UC - REFER ENG. DRAWINGS

Location:	Refer to the structural Engineers drawings and documentation for requirements
Steel Grade	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Refer to the structural Engineers drawings and documentation for requirements and also the fire Report if appended
Shop Drawings:	Refer to the structural Engineers drawings and documentation for requirements
FRR:	Refer to the fire report and documentation for all requirements and also the separate section on intumescent coatings

4.2 STEEL UB - REFER ENG. DRAWINGS

Location:	Refer to the structural Engineers drawings and documentation for requirements
Steel Grade	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Refer to the structural Engineers drawings and documentation for requirements and also the fire Report if appended
Shop Drawings:	Refer to the structural Engineers drawings and documentation for requirements
FRR:	Refer to the fire report and documentation for all requirements and also the separate section on intumescent coatings

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4.3 STEEL PFC - REFER ENG. DRAWINGS

Location:	Refer to the structural Engineers drawings and documentation for requirements
Steel Grade	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Refer to the structural Engineers drawings and documentation for requirements and also the fire Report if appended
Shop Drawings:	Refer to the structural Engineers drawings and documentation for requirements
FRR:	Refer to the fire report and documentation for all requirements and also the separate section on intumescent coatings

4.4 STEEL PORTAL - REFER ENG.DRAWINGS

Location:	Refer to the structural Engineers drawings and documentation for requirements
Steel Grade	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Refer to the structural Engineers drawings and documentation for requirements and also the fire Report if appended
Shop Drawings:	Refer to the structural Engineers drawings and documentation for requirements
FRR:	Refer to the fire report and documentation for all requirements and also the separate section on intumescent coatings

4.5 STEEL ANGLE - REFER ENG. DRAWINGS

Location:	Refer to the structural Engineers drawings and documentation for requirements
Steel Grade	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Refer to the structural Engineers drawings and documentation for requirements and also the fire Report if appended
Shop Drawings:	Refer to the structural Engineers drawings and documentation for requirements
FRR:	Refer to the fire report and documentation for all requirements and also the separate section on intumescent coatings

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3811 PREFABRICATED STRUCTURAL TIMBER TRUSSES

1 GENERAL

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

- timber trusses

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Requirements

1.4 QUALIFICATIONS

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

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

1.5 DESIGN CRITERIA NON-SPECIFIC DESIGN

Frames and trusses to NZS 3604.

1.6 DESIGN CRITERIA SED

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

Documentation required for the Code Compliance Certificate application

1.7 PROVISION OF STATEMENTS

Provide the following documentation. The statements shall include the name and position within the company of the person providing the statement.

Fabricator Design and Manufacturing Statements shall be noted as being:

- Issued by a named company, accredited as a fabricator by the nail plate manufacturer
- Issued to the named Owner and available for use by a BCA to assist in determining compliance with the NZBC.

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1.8 DESIGN STATEMENT - FABRICATOR

Provide a Design Statement issued by the fabricator listing the job specific inputs used in the design process.

The Design Statement shall identify:

- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- Software date/version
- Reference to the Producer Statement - Design
- Supporting compliance documents including standards for material grades and sizes
- The job/design reference name or number
- The site address/location

Job specific information:

- Loads allowed for in the specific design including dead loads (cladding and ceiling) and live loads (wind and snow)
- Roof pitch
- Nominal overhang length
- Importance Level

Design working life:

- A list of the designed trusses, spans and maximum spacing
- Date of design

1.9 PRODUCER STATEMENT - DESIGN

Provide a Producer Statement - Design issued by the software provider, supporting the software and the engineering principles being applied by the software.

The Producer Statement shall:

- Have a level of detail consistent with that of an IPENZ Producer Statement PS1
- State the means of compliance with NZBC
- Reference the truss layout and Fabricator Design Statements
- Identify the job/design reference name or number
- Identify the software date/version
- Be signed by a Chartered Professional Engineer

1.10 MANUFACTURING STATEMENT - PREFABRICATED TRUSSES

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

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

Truss identification

1.11 IDENTIFICATION OF TRUSSES ON SITE

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

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

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

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

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2 PRODUCTS

Materials

2.1 TRUSSES NOT EXPOSED

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

2.2 FRAMES NOT EXPOSED

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

Accessories

2.3 STEEL CONNECTOR PLATES

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

2.4 CORROSION RISKS

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

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

3 EXECUTION

Conditions

3.1 COMPLY

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

3.2 DELIVER, HANDLE AND STORE TRUSSES AND FRAMES

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

Fabrication

3.3 DIMENSIONS, NOT EXPOSED ELEMENTS

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

3.4 DIMENSIONS, EXPOSED ELEMENTS

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

3.5 INSPECTION

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

3.6 FABRICATION

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

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3.7 TRUSS AND FRAME FIXINGS

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

Site installation

3.8 TRUSS ERECTION

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

3.9 FRAME ERECTION

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

3.10 FIT CONNECTORS AND FIXINGS - TRUSS

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

3.11 FIT CONNECTORS AND FIXINGS - FRAMES

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

3.12 ROOF BRACING

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

3.13 WALL BRACING

Refer to 3821 TIMBER FRAMING for wall bracing.

3.14 DPC TO TIMBER

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

3.15 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

Completion

3.16 REPLACE

Replace or repair damaged elements.

3.17 REMOVE

Remove debris, unused materials and elements from the site.



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3.18 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

4.1 PREFABRICATED TIMBER TRUSSES

Location:	Refer to truss manufacturers documentation and roof framing plans
Species/grade:	Radiata Pine, SG8
Moisture content:	20% maximum
Treatment:	Minimum H1.2
Centres:	Max 900mm, refer to the truss manufacturers drawings and documentation
Connectors:	Hot-dip galvanized, and or as determined in NZS 3604 and NZBC E2/AS1
General:	Designed in accordance with NZS 3604
End Connectors:	Mitek / Lumberlok or equal approved system to suit the requirements of the design and its intent
Note:	Allow for the truss manufacture to liaise with the structural Engineer as required on all components/ producer statements of the truss design.
General:	Refer to the truss manufacturers drawings and documentation for requirements to heel heights, set outs, fly rafters, and outrigger requirements
HIRB:	The contractor is to check and confirm against the RC documentation that the proposed manufactured truss complies with the HIRB, prior to fabrication

Fire Requirements

4.2 PREFABRICATED TIMBER TRUSSES FIRE REQUIREMENTS

Fire:	Refer to the fire report for requirements on Duplex’s, where it specifically requires that the trusses are to be ‘back set’ to allow the Gib Fyreline to enclose the ceiling cavity

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3821 TIMBER FRAMING

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as part of a partitioning system.

1.1 RELATED WORK

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

Refer to 3813F LVL STRUCTURAL FRAMING

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC®	Forest Stewardship Council®
COC	Chain of Custody
PEFC	Programme for the Endorsement of Forest Certification

The following definitions apply specifically to this section:

SG Structural grade to NZS 3604, 1.3 Definitions

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 673	Cavity battens

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

1.4 DIMENSIONS

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

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2 PRODUCTS

2.1 SUSTAINABLE TIMBER

This project uses FSC Certified sustainable timber.

Abbreviations and definitions:
FSC
- Forest Stewardship Council

FSC Forest Management (FM) Certification
- A forest management unit independently FSC inspected and certified that it complies with the internationally-agreed FSC Principles.

FSC Chain of Custody (COC) Certification
- COC certification applies to those who process, transform or trade forest products, providing a guarantee about the production and source of FSC-certified products and tracking the production and distribution of the products.

Organisation website details
FSC website:- https://nz.fsc.org/en-nz
FSC suppliers lists:- https://info.fsc.org/certificate.php#result

2.2 CERTIFIED SUSTAINABLE TIMBER

Refer to SELECTIONS for details of amount, type, suppliers.
Certified Sustainable FSC- COC Certified (or similar pre-approved) timber from forest to installation. Contractor to obtain and track all timber FSC-COC certificates and receipts showing FSC-COC numbers, including signed FSC outsourcing agreements between parties (ie FSC timber broker and non-FSC door joiner).
FSC suppliers lists:- https://info.fsc.org/certificate.php#result

Materials

2.3 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.

2.4 APPEARANCE TIMBERS

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

2.5 STRAPPING

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

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

2.6 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.7 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"

2.8 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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Components

2.9 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.

2.10 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.

2.11 THREADED RODS

Use stainless steel threaded rods of the required length, with washers and nuts at both ends, when stainless steel bolts of the required length are not available.

2.12 TIMBER CONNECTORS AND FIXINGS

Supply for each particular joint the connectors and fixings as noted on the drawings. Comply with the requirements of the manufacturer, NZS 3604, section 4, Durability, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

2.13 BRACING STRAPS

Nail-on type to the requirements of NZS 3604, section 4, Durability, and of the number and form required for each particular application to NZS 3604, sections 6-10.

2.14 POWDER ACTUATED FASTENERS

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

2.15 CORROSION RISKS

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

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

3 EXECUTION

Conditions

3.1 PROTECT TIMBER

Protect all timber against damage and from inclement weather. Ensure that any variation in moisture content is kept to a minimum, before and after erection and before enclosure.

3.2 EXECUTION

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

3.3 SEPARATION

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

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

3.4 FRAMING MOISTURE CONTENT

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

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

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3.5 TOLERANCES

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

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

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

- Deviation from vertical position per 3 metres, 3mm

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

Application

3.6 SET-OUT

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

3.7 SET TIMBERS

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

3.8 TIMBER CUTTING

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

3.9 TIMBER PLATES AND FURRING

Fix to steelwork with bolts and washers or approved proprietary fastenings at 1 metre maximum spacing and not less than 2 fixings to each member, or to engineering specific design.

3.10 HOLES AND NOTCHES

Limit holes and notches, checks and half-housing for the structure to those allowable in NZS 3604. Neatly form holes and notches for services without lessening the structural integrity of the member.

3.11 CUTTING

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

3.12 EXPOSED TIMBER CONNECTORS AND FIXINGS

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

3.13 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of WorkSafe NZ and the Health and Safety at Work Act 2015. Powder-actuated fastening tool operators to have the appropriate current Certificate and/or Licence and tools to have the appropriate certificate of fitness if necessary.

3.14 ADDITIONAL FRAMING

Position and fix all necessary members for the fixing of all services, fittings, fixtures, edges of linings or claddings, and to provide lateral support to load carrying framing.

3.15 FORM NAILED JOINTS

Fully drive nails in all structural joints with the number and location for each particular joint, to the requirements of the nailing schedules of NZS 3604. Where splitting could occur, pre-drill to 80% of nail diameter.

3.16 FORM BOLTED JOINTS

Drill for and set bolts to ensure full bearing and development of the joint strength, with tension to just set the washers into timber or to engineering specific design.

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3.17 FIT CONNECTORS AND FIXINGS

Fit connectors and fixings to obtain full bearing over all contact surfaces and full development of the required loading capacity for that particular joint and in accordance with the manufacturer's requirements or to engineering specific design.

3.18 FIT JAMB BATTENS

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

3.19 FIT 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. Make allowances for cladding control joints where required. Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc).

3.20 FIT BRACING

Fit and fix subfloor, wall and roof bracing elements to the requirements of the manufacturer or to NZS 3604, to develop the full number of bracing units required.

3.21 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.22 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.23 CLEAN UP

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

3.24 LEAVE

Leave work to the standard required by following procedures.

3.25 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Floor Framing - where required by the project

4.1 H1.2 TIMBER JOIST - REFER STRUC. ENG.

Location:	Floors, refer to the Structural Engineers drawings and documentation for requirements
Member:	Enclosed timber Joist framing (subfloor or midfloor) - where required and shown on the drawings
Size:	Refer to the Structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 and also refer to the structural Engineers drawings and documentation for requirements
Treatment:	H1.2 (Enclosed only)
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	Refer to the structural Engineers drawings and documentation for requirements

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4.2 H3.2 TIMBER BEARER - REFER STRUC. ENG.

Location:	Floors, refer to the Structural Engineers drawings and documentation for requirements
Member:	timber framing (subfloor or midfloor) - where required and shown on the drawings
Size:	Refer to the Structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 and also refer to the structural Engineers drawings and documentation for requirements
Treatment:	H3.2
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	Refer to the structural Engineers drawings and documentation for requirements

4.3 H5 TIMBER PILE - REFER STRUC. ENG.

Location:	Floors, refer to the Structural Engineers drawings and documentation for requirements
Member:	timber framing (subfloor or midfloor) - where required and shown on the drawings
Size:	Refer to the Structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 and also refer to the structural Engineers drawings and documentation for requirements
Treatment:	H5
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	Refer to the structural Engineers drawings and documentation for requirements

4.4 TIMBER DWANG / BLOCKING - REFER SPEC

Location:	Timber blocking and or Dwang - refer to the drawings and documentation for requirements
Member:	Dwang and or Blocking
Size:	Sized to suit requirement and Intent of the detail and or drawings or to suit surrounding timber sizes
Species:	Radiata pine
Grade:	SG8
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Stud/ Dwang Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

Wall Framing

4.5 TIMBER PACKER - REFER SPEC

Location:	Timber Packer - refer to the drawings and documentation for requirements
Member:	Timber Packer
Size:	Sized to suit requirement and Intent of the detail and or drawings or to suit surrounding timber sizes
Species:	Radiata pine
Grade:	SG8
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

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4.6 H3.1 TIMBER PACKER - REFER SPEC

Location:	Timber Packer - refer to the drawings and documentation for requirements
Member:	Timber Packer
Size:	Sized to suit requirement and Intent of the detail and or drawings or to suit surrounding timber sizes
Species:	Radiata pine
Grade:	SG8
Treatment:	Minimum H3.1 and or to suit surrounding timber treatments
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

Wall Framing

4.7 H1.2 WALL STRAPPING - REFER SPEC

Location:	Timber framing - refer to the drawings and documentation for requirements
Member:	Wall Framing
Size:	45mm x 45mm
Species:	Radiata pine
Grade:	SG8
Treatment:	H1.2
Stud/ Dwang Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

4.8 BOTTOM PLATE - REFER SPEC

Location:	Timber framing - refer to the structural Engineers drawings and documentation for requirements
Member:	Bottom Plate
Size:	90mm x 45mm - refer to the structural drawings for size and set out requirements
DPC:	Allow for DPC under the bottom plate to the Minimum requirements of NZBC E2 and NZS3604
Species:	Radiata pine
Grade:	SG8
Treatment:	H1.2 UPPER BOTTOM PLATE
Stud/ Dwang Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Bottom Plate Fixing:	Refer to the structural Engineers drawings and documentation for requirements

4.9 H1.2 TOP PLATE - REFER SPEC

Location:	Timber framing - refer to the structural Engineers drawings and documentation for requirements
Member:	Top Plate
Size:	90mm x 45mm - refer to the structural drawings for size and set out requirements
Species:	Radiata pine
Grade:	SG8
Treatment:	H1.2
Stud/ Dwang Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

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4.10 H1.2 WALL FRAMING - REFER SPEC

Location:	Timber framing - refer to the drawings and documentation for requirements
Member:	Wall Framing
Size:	90mm x 45mm or 140 x 45mm - refer structural and architectural drawings.
Species:	Radiata pine
Grade:	SG8
Treatment:	H1.2
Stud/ Dwang Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails
Void Filler:	Allow for Sika Boom or equal approved product To all wall framing nogs in between full studs where and as required (interior wall junctions and external triple stud comers) to complete the thermal envelope

Cavity Battens

4.11 H3.1 HORZ. CAVITY BATTEN - REFER SPEC

Location:	Refer to the drawings and documentation and the specific cladding manufacturer for product requirements and recommendations
Member:	Horz Cavity Batten
Size:	Refer to the specific cladding manufacturer for product requirements and recommendations
Species:	Radiata pine - Refer to the specific cladding manufacturer for product requirements and recommendations
Grade:	SG8
Treatment:	H3.1 - refer to the specific cladding manufacturer for product requirements and recommendations
Set Out:	Refer to the structural Engineers drawings and documentation and the specific cladding manufacturer for product installation requirements and recommendations
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails and to the specific cladding manufacturer for product installation requirements and recommendations

4.12 NOT USED

Timber Lintel and Beam

4.13 TIMBER LINTEL - REFER ENG. DRAWINGS

Location:	Within the timber wall framing - refer to the drawings and documentation for requirements
Member:	Timber Lintel
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

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4.14 TIMBER BEAM - REFER ENG. DRAWINGS

Location:	Within the timber wall framing - refer to the drawings and documentation for requirements
Member:	Timber Beam
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

4.15 TIMBER RIBBON PLATE - REFER ENG. DRAWINGS

Location:	Refer to the drawings and documentation for requirements
Member:	Timber Ribbon Plate
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

4.16 TIMBER PURLIN - REFER TRUSS DESIGN

Location:	Refer to the drawings and documentation for requirements
Member:	Timber Purlin
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

Roof Framing

4.17 H1.2 ROOF PURLIN

Location:	Within the timber roof structure - refer to the drawings and documentation for requirements
Member:	Roof Purlin
Size:	Min 70mm x 45mm - refer to the structural drawings for size and set out requirements
Species:	Radiata pine
Grade:	SG8
Treatment:	H1.2
Set Out:	Max 900mm centres - refer to the structural drawings for size and set out requirements
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails
General:	Refer to the roofing manufacturers documentation for windzones and the spacing requirements Purlin at the roofing edge

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4.18 H1.2 TIMBER RAFTER - REFER ENG. DRAWINGS

Location:	Within the timber roof structure, refer to the drawings and documentation for requirements
Member:	Timber Rafter - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

4.19 H1.2 TIMBER OUTRIGGER - REFER ENG. DRAWINGS

Location:	Within the timber roof structure - refer to the drawings and documentation for requirements
Member:	Timber Outrigger - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

4.20 H1.2 SOFFIT FRAMING - REFER SPEC

Location:	Within the timber roof structure - refer to the drawings and documentation for requirements
Member:	Timber Soffit Framing
Size:	90mm x 45mm - refer to the structural drawings for size and set out requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H1.2 and or to suit surrounding timber treatments
Set Out:	Refer to the structural Engineers drawings and documentation for requirements
Fixings:	Refer to the structural Engineers drawings and documentation for requirements

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Exterior Timber

4.21 EXTERIOR STRUCTURAL POST - REFER ENG. DRAWINGS

Location:	Exterior Veranda, Entry - refer to the drawings and documentation for requirements
Member:	Timber exterior posts (H5 or Prolam or similar) Refer to the structural Engineers drawings and documentation for requirements - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Grade:	Refer to the structural Engineers drawings and documentation for requirements
Treatment:	Refer to the structural Engineers drawings and documentation for requirements
Fixing:	Refer to the structural Engineers drawings and documentation for requirements
Finish:	Clears Grade with approved paint finish over - also refer to the painting selections

4.22 H3.2 EXTERIOR RAFTER - REFER ENG. DRAWINGS

Location:	Within the timber roof structure and as required - refer to the drawings and documentation for requirements
Member:	Timber Rafter - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	Min SG8 or as required by the structural Engineers drawings and documentation
Treatment:	Minimum H3.2 and or to suit surrounding timber treatments , or as required by the structural Engineers drawings and documentation
Finish:	Clears Grade - not painted
Set Out:	Max 900mm centres, also refer to the requirements
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails. llow for Corrosion Zone D requirements

4.23 H4 EXTERIOR HANDRAIL POSTS

Location:	Where required for steps and 1:12 ramps and as per the requirements of the current Ed. of K-049
Member:	Exterior Handrail Post - refer to the drawings and documentation for requirements
Size:	100mm x 100mm
Species:	Radiata pine
Grade:	SG8
Treatment:	Min H4
Set Out:	Max 1200mm centres or equally set out to suit step or ramp/stair dimensional set out
Foundations:	Suitable sized foundations to the minimum requirements of NZS3604
Note:	The tops should be sloped to suit handrail set out / water shedding, and a handrail is required to at least one side of the step
K-049 Requirements:	All exterior stairs and ramps are to include at least one hand-rail.
Finish:	Gauged - not painted

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4.24 H3.2 EXTERIOR HANDRAILS - REFER SPEC

Location:	All exterior steps and 1:12 ramps and as per the requirements of the current Ed. of the K-049
Member:	Exterior Timber Graspable profiled handrails- refer to the drawings and documentation for requirements
Size:	180mm x 40mm
Species:	Radiata pine
Grade:	SG8
Profile:	Graspable profiled Hand-rail - profiles must comply with the MBIE's (2016) Acceptable Solutions and Verification Methods for New Zealand Building Code Clause D1 – Access Routes.
Treatment:	Min H3.2
Set Out Height:	Min 900mm high , max 1000mm - also refer to the requirements NZBC D1 Figure 25
ACC and FUD requirements:	Ensure that the grab rail extends 300mm pastthe top tread and 300mm plus the depth of the tread at bottom riser.
Fixings:	Minimum of 1 x M12 Recessed Coach bolt, ensure that the thread is cut back to stop snagging and there is sufficient edge distance to the bolt (bottom of handrail and top of post)
Finish:	Gauged - not painted

Exposed Deck Framing and Steps - where required by the project

4.25 H3.2 EXTERIOR TIMBER STEPS - REFER SPEC

Location:	As and where required to fulfil the intent of the site levels and as generally shown on the drawings
Member:	Exterior steps
Size:	90mm x 32mm (grip side up for slip resistance)
Species:	Radiata pine
Grade:	SG8
Treatment:	Min H3.2
Finish:	Clears Grade - not painted
Set Out:	Max 600mm centres, also refer to the requirements
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails
Note:	All steps are to be accessible with a max 180mm riser and max 310mm tread Have a minimum clear-width of 1.2m.

4.26 H3.2 EXTERIOR DECK JOISTS - REFER ENG. DRAWINGS

Location:	Exterior Deck - refer to the drawings and documentation for requirements
Member:	Exterior deck, Ramp and or stair joists - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	SG8
Treatment:	Min H3.2
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

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4.27 H3.2 EXTERIOR DECK BEARERS - REFER ENG. DRAWINGS

Location:	Exterior Deck - refer to the drawings and documentation for requirements
Member:	Exterior Bearers - where required and shown on the drawings
Size:	Refer to the structural Engineers drawings and documentation for requirements
Species:	Radiata pine
Grade:	SG8
Treatment:	Min H3.2
Fixings:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails

Fixings

4.28 NAILS

Framing General:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails
Cladding General:	Refer to the Manufacturers literature for all claddings and their specific requirements
Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1 and or as per the requirements from the Cladding manufacturers recommendation and documentations

4.29 BASEPLATE FIXING - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.30 ENGINEERING BOLTS - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.31 ENGINEERING SCREWS - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

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Timber Connectors

4.32 NAIL PLATES - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.33 STUDSTRAP - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.34 JOIST HANGER - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.35 SPLIT HANGER - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

4.36 ROOF BRACING - REFER ENG. DRAWINGS

Material:	Galvanized steel (exposure zones B and C) OR 316 stainless steel (exposure zones B,C,D and E as determined in NZS 3604 and NZBC E2/AS1
Type:	Refer to the structural Engineers drawings and documentation for requirements
Size:	Refer to the structural Engineers drawings and documentation for requirements

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4161 UNDERLAYS, FOILS & DPC

1 GENERAL

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

1.1 RELATED WORK

Refer to 4161MP for Masons 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:

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

The following definitions apply specifically to this section:

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

Documents

1.3 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
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4347	Damp-proof courses and flashings - Methods of test
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
CodeMark CMNZ10002 ver5	Watergate Plus Wall Underlay
CodeMark CMNZ30028 verK	Thermakraft Covertek 407 Roof and Wall Underlay
CodeMark CMNZ30030 verJ	Thermakraft Covertek 405 Roof and Wall Underlay
CodeMark CMNZ30069 verI	Thermakraft Covertek 403 Roof and Wall Underlay

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Thermakraft's Product Data Sheets
Thermakraft's Installation Guides
BRANZ Appraisal 329 (2022) - Supercourse 500 Damp-Proof Course and Concealed Flashing - Amendment 29 August 2023
BRANZ Appraisal 651 (2024) - Thermakraft Covertek 407 Roof and Wall Underlay - Amended 13 July 2026
BRANZ Appraisal 695 (2023) - Watergate Plus Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 743(2025) - Thermakraft Covertek 405 Roof and Wall Underlay

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BRANZ Appraisal 878 (2025) - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 912 (2021) - Thermakraft 220 Synthetic Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 917(2025) - Thermakraft Covertek 403 Roof and Wall Underlay
BRANZ Appraisal 942 (2022) - OneSeal Multi-fit Pipe and Cable Penetration Seals - Amended 28 July 2026
BRANZ Appraisal 943 (2021) - Thermakraft Covertek 401 Roof and Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 1000 (2023) - Thermakraft Thermabar 397 Light Diffusing Reflective Underlay - Amended 01 July 2025
BRANZ Appraisal 1029 (2023) - Thermakraft Ausnet Hexagonal Wire Mesh
BRANZ Appraisal 1104 (2020) - Thermathene Orange Concrete Underlay - Amendment 06 September 2024
BRANZ Appraisal 1122 (2026) - Thermaflash Flashing Tape
BRANZ Appraisal 1229 (2023) - Thermakraft Covertek 215 Roof Underlay - Amended 19 June 2025
BRANZ Appraisal 1277 (2025) - Thermakraft RainArmor Self Adhesive Roof Underlay and Wall Underlay

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Kingspan Thermakraft product range.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Ltd warrant performance of products if design and installation comply with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of Thermakraft™ Product Warranty available on request.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

2 PRODUCTS

Performance - general

Materials

Damp Proof Course

2.1 THERMAKRAFT SUPERCOURSE 500

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

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Damp Proof Membrane

2.2 THERMAKRAFT THERMATHENE ORANGE

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

Wall underlays

Roof underlays

2.3 THERMAKRAFT COVERTEK 407

CodeMark certified and BRANZ appraised self-supporting synthetic roof and wall underlay, white with red logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤5. Available in 1250mm, 2550mm and 2740mm width. Suitable for use as an Early Close Wall Application providing up to 120 days temporary weather protection. Suitable for use as temporary weather protection for up to 30 days on roofs. Refer to SELECTIONS.

2.4 THERMAKRAFT COVERTEK 401

BRANZ appraised self-supporting synthetic roof and wall underlay, light grey with dark grey logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Available in 1350mm and 2700mm width. Refer to SELECTIONS.

Accessories

2.5 THERMAFLASH™ FLASHING TAPE

Thermaflash™ is a self-adhesive synthetic flexible window flashing tape, with superior adhesion. Can be used with rigid air barrier or rigid wall underlay products. Suitable for use as a flexible flashing around window and door joinery openings, available in widths of 75mm, 150mm and 200mm. On windows, the use of a Thermakraft Corner Mould™, is optional however butterfly strips must be applied. Use in conjunction with air seals and joinery flashing systems around window and door joinery on timber, steel framed and medium rise buildings. Compatible with a wide range of sealants but check compatibility. Maximum exposure 180 days. Refer to BRANZ Appraisal 1122.

Approved for use with the James Hardie™ RAB™ Board system, refer BRANZ Appraisal 611.

2.6 THERMAKRAFT ONESEAL

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

2.7 THERMAKRAFT STUD STRAP

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

2.8 THERMAKRAFT PREMIUM JOINING TAPE

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

2.9 DRAINAGE MAT™

Thermakraft Drainage Mat™, a 7mm extruded three-dimensional black polypropylene mesh which provides an uninterrupted drainage path and ventilation between the roof cladding and roof underlay. Used under long-run steel roof where specific drainage and ventilation is required. Can be used in wind zones up to and including Extra High. If using on a roof pitch of less than 3° then Specific Engineering Design is required. The strand entanglement is designed to withstand compression forces resulting from typical roof fixings.

2.10 NO SUBSTITUTIONS

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

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Compliance information - CodeMark certified

2.11 CODEMARK CERTIFICATE - THERMAKRAFT COVERTEK 407

Thermakraft Covertek 407 roof and wall underlay and Covertek 407 Early Close Wall Application meet the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30028.

2.12 BRANZ APPRAISED - THERMAKRAFT COVERTEK 407

Thermakraft Covertek 407 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 651

2.13 BRANZ APPRAISED - THERMAKRAFT COVERTEK 401

Thermakraft Covertek 401 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 943

2.14 BRANZ APPRAISED - THERMAKRAFT THERMATHENE ORANGE

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

2.15 BRANZ APPRAISED - THERMAKRAFT SUPERCOURSE 500

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

Compliance information - BRANZ appraised

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

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

Application DPC

3.2 DPC TO LOSP/CCA TREATED TIMBER

Lay Supercourse 500™ DPC under LOSP or CCA treated bottom plate of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.3 DPC TO TIMBER / STEEL

Lay Supercourse 500™ under the bottom plate of all timber / steel framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

Refer to SELECTIONS for type.

3.4 DPC TO MASONRY AND BRICK VENEER

Lay Supercourse 500™ along based of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

Application - DPM

3.5 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand blinding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type. Tape all joints and penetrations with joining tape.

3.6 DPM TO GROUND UNDER SUSPENDED TIMBER FLOOR

Lay DPM on ground under enclosed subfloor suspended timber floor in accordance with NZS 3604, 6.14.3, Ground cover, and as follows.

Ensure that:

- the vapour barrier is weighted down and held against air movement by bricks or rocks
- total subfloor ground area is covered
- polyethylene sheet is new and un-punctured
- adjacent sheets are lapped a minimum of 75mm

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- sheets are butted up to surrounding foundation walls, piles and other penetrating elements
- ground is shaped to prevent water accumulation on the vapour barrier and to drain to the exterior.

Note: In accordance with NZS 3604 the minimum requirement for subfloor ventilation under all situations is to be no less than 700mm² for every 1m² of floor area.

Application - wall underlay

3.7 WALL UNDERLAY

Fix horizontally to outside face of framing in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, 9.1.7, Wall underlay, and refer to Thermakraft for requirement for fastenings. Fix to Thermakraft Technical Data specifications. Scribe neatly around penetrations and openings to leave no gaps. Flash all openings and tape all penetrations in accordance with Thermakraft Installation Guides. Keep clean, undamaged and without visible weather deterioration until closed in.

3.8 INSTALL STUD STRAPS

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

3.9 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of DPC Thermakraft Supercourse 500™ as a separator between the timber and metal cladding.

Application - roof underlay

3.10 SAFETY MESH

Lay Thermakraft Ausmesh™ safety mesh over exposed roof areas fixed in accordance with AS/NZS 4389 and NZMRM CoP.

3.11 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixings. Lay underlay to avoid excessive dishing between purlins. When used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without wire mesh support. Horizontally lay 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 and avoid prolonged exposure by installing the roof immediately. UV exposure is a maximum of 7 days.

Completion

3.12 COMPLETION MATTERS

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

4 SELECTIONS

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

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Damp Proof Course

4.1 DPC - REFER SPEC

Location:	As and where required to fulfil the intent of the drawings and is generally to be used for separating timber, wood-based products and metal, from concrete, masonry or brick In accordance with NZS 3604, NZS 4229 and NZBC E2
Brand:	Thermakraft.
Type:	Supercourse 500™ DPC
Application:	The strip of Supercourse 500 must be wide enough to fully protect the width of material in contact with concrete or masonry. Note: when use as a DPC, the roll width selected must be enable the Supercourse 500 to extend 6mm beyond each face of the timber in accordance with the requirement of the NZ 3604 standard paragraph 2.3.3 (b). A small slit should be made in the material to accommodate the bolts or fixings when used under timber plates or concrete floors or foundation walls. Alternative, a small hole can be formed by gently tapping the product resting on top of the bolt until a puncture is formed.
Installation:	Supercourse 500 must be fixed in place to framing members at 300mm centres with small hot-dip galvanised clouts. Horizontal and vertical joints must be no less than 75mm wide, with the direction of the lap ensuring that water is shed to the outer face of the flashing.
Note:	**Refer to Thermakraft installation manual for full installation requirements.**

Damp Proof Membrane

4.2 DPM - REFER SPEC

Location:	As and where required to fulfil the intent of the drawings, and in accordance with NZBC, and NZS 3604 (current Editions)
Brand:	Thermakraft.
Type:	Thermathene Orange
Joining tape:	Thermakraft White General Purpose Tape or Thermakraft Premium Joining Tape. Thermathene Orange must be laid in a continuous manner with all laps minimum 150mm.

Roof underlays - bituminous, self-supporting

4.3 ROOF UNDERLAY - THERMAKRAFT COVERTEK 401

Location:	Roof - refer drawings
Manufacturer:	Thermakraft
Brand:	Covertek 401
Type:	Synthetic roof and wall underlay
Width:	1350mm, 2700mm
Fixings:	Galvanized Little Grippers Galvanized 6mm-8mm staples Galvanized 20mm large head clouts
Maximum UV exposure:	Walls - 60 days Roofs - 7 days

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4.4 ROOF UNDERLAY - THERMAKRAFT COVERTEK 407 - TO UNIT

Location:	Thermakraft Covertek 407 (Fire retardant) self-supporting synthetic roof underlay to Unit residence, 1m min. to be extended on each sides.
Manufacturer:	Thermakraft
Brand:	Covertek 407
Type:	Synthetic roof and wall underlay
Width:	1350mm, 2700mm
Fixings:	Galvanized Little Grippers Galvanized 6mm-8mm staples Galvanized 20mm large head clouts
Maximum UV exposure:	Walls - 60 days Roofs - 7 days

Window and joinery flashing tape

4.5 FLASHING TAPE - REFER SPEC

Location:	Refer to the drawings for Intent, and as generally where required around window and door joinery openings on timber and steel framed buildings.
Use:	Thermaflash window flashing tape is installed into and around joinery openings over the wall underlay and exposed frame to cover both the face and edge of the opening as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.
Brand:	Thermakraft
90mm framing:	Thermakraft Thermaflash.
Corners:	**Refer to Thermakraft Thermaflash installation requirements for corners.** Fix a Thermakraft Corner Mould to the bottom corners by way of staples or clouts to the two jambs.
Butterfly corners:	Thermakraft Corner Mould is optional. However, lower butterfly strips MUST be installed in the absence of the Thermakraft Corner Mould. **Refer to Thermakraft Installation Guide for full requirements.**
Note:	**Most window sealants will bond directly to Thermaflash. However, the installer must check the bonding strength and chemical compatibility of the sealant and tape before installation.** **The installer must check the compatibility of the Thermaflash flashing tape with the sealant or adhesive product to ensure the components are fully compatible.**

Miscellaneous

4.6 PENETRATION SEAL - REFER SPEC

Location:	As and where required to fulfil the intent of the drawings for all penetrations
Brand:	Thermakraft.
Type:	Thermakraft OneSeal
Application:	Kingspan Thermakraft OneSeal is a unique multi-fit system providing air and water resistance for pipes and cables. **Refer Thermakraft Oneseal installation guide for full installation requirements and limitations.**

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4.7 INSULATION STUD STRAP

Location:	As and where required by NZBC E2/AS1 for cavity construction with framing centres greater than 450mm to prevent wall insulation pushing into the cavity.
Brand:	Thermakraft Stud Strap, or equal approved alternative
Type:	25mm wide high tensile woven polyethylene strap

Joining Tape

4.8 JOINING TAPE - REFER SPEC

Location:	Refer to the drawings for Intent, and as generally where required around window and door joinery openings on timber and steel framed buildings
Use:	Thermakraft Premium Joining Tape is part of the RAB™ Board system by James Hardie™. It can be used to join the laps of wall and roof underlays, damp proof membranes, vapour control products such as foil underlays and rigid sheathing products (e.g. plywood rigid underlay, OSB board, fibre cement and insulation panels). **Installer must check the compatibility of Thermakraft Premium Joining Tape with the substrate manufacturer.**
Brand:	Thermakraft
Limitations:	Thermakraft Premium Joining Tape is NOT a window flashing tape and must NOT be used as a window flashing tape.

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4161MP MASONS UNDERLAYS, DPM & DPC

1 GENERAL

This section relates to the application of Masons NZ Limited products. It includes:

- DPM & DPC
- Roof underlays
- Wall underlays
- Installation 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:

COP	NZ Metal Roof and Wall Cladding Code of Practice
DPC	Damp-proof course
EPDM	Ethylene propylene diene monomer
FAB	Flexible Air Barrier
GSM	Grams per Square Metre
LOSP	Light Organic Solvent Preservative
LRV	Light reflectance value
MRM	NZ Metal Roofing Manufacturers Association Inc.
NASH	National Association of Steel Framed Housing Inc.
PEF	Polyethylene foam
PET	Polyethylene Terephthalate
VHP	Very High Permeability

The following definitions apply specifically to this section:

Wall underlay	As defined in NZBC E2/AS1 and in NZBC E2/AS4 - NASH Building Envelope Solutions - A building paper, synthetic material or rigid sheathing used as part of the wall cladding system to assist the control of moisture by ensuring moisture which occasionally penetrates the wall cladding is directed back to the exterior of the building.
Roof underlay	As defined in NZS 2295 - An absorbent permeable building underlay, used as part of the building's water management system in the roof cladding system, that absorbs or collects condensation or water that may penetrate the roof cladding.

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E2/AS4	External moisture - Light steel framing weathertight solution for buildings up to 3 storeys or of 10m or less in height with a floor area not exceeding 300m²
NZS/AS 1530.2	Methods of 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 4201.4	Pliable building membranes and underlays - Methods of test - Resistance to water penetration

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AS/NZS 4389	Roof safety mesh
AAMA 711-13	Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products
MRM CoP	NZ Metal roof and wall cladding code of practice
NASH Building Envelope Solutions	2019 Light Steel Framed Buildings
NASH Standard Part 2	May 2019 Light Steel Framed Buildings
CodeMark™ CMNZ70072 ver 4	Masons Barricade FR
CodeMark™ CMNZ70075 ver 4	Masons Flashing Tapes
CodeMark™ CMNZ70098ver 4	Masons Roof Underlays - VHP® Value, VHP® Strong, VHP® Ultra, VHP® Maxi
CodeMark™ CMNZ70116 ver 2	Masons UNI® and UNI® PLUS Flexible Air Barriers
CodeMark™ CMNZ70117 ver 1	Masons UNI® PRO Flexible Air Barrier
CodeMark™ CMNZ70142 ver 1	Masons Barricade WD Self-Adhesive Weather-Resistive Barrier
CodeMark™ CMNZ70172 ver 0	White-faced Foil Composite Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Masons Dry Fix™ Damp-Proof Course
- Product brochure and specification

Masons Roof Underlays - VHP® Maxi, VHP® Ultra, VHP® Strong, VHP® Value:
- Product brochure
- Installation instructions V4.0 May 2025
- Material data safety sheet

Masons White-Faced Foil:
- Design and Installation Guide V1.2 October 2024
- Material Safety Data Sheet

Masons Barricade™ FR Fire Retardant Building Wrap:
- Product brochure
- Design and Installation Guide V2.0 May 2025
- Material safety data sheet
- Specification Guide V2.0 March 2024

Masons Barricade WD Self-Adhesive Weather Resistive Barrier:
- Product brochure
- Installation guide V1.0 August 2022 and Visual Installation Guide
- Technical data sheet V1.1 June 2022

Masons UNI® PLUS Flexible Air Barrier:
- Specification Guide V1.0 January 2022
- Design and installation guide V2.2 May 2026
- Material Safety data sheet
- Alternative Solution documents: Product Assurance Supplier Statement (PASS™ No. 19192) and Standards Comparison Report

Masons UNI® PRO Flexible Air Barrier:
- Specification Guide V1.0 January 2022

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- Design and installation guide V2.0 May 2025
- Material safety data sheet
- Technical data sheet V1.0 January 2022

Masons Insul-Baffle,

- Design and Installation Guide V1.1 February 2025
- Data sheet V1.1 February 2025

Masons 40 Below™ Flashing Tapes:

- Specification guide V3.0 March 2024
- Installation instructions
- Material safety data sheet

Masons Hydro™ Window Flashing Tape & Corner Guards:

- Specification guide V2.0 March 2024
- Installation instructions

Masons PEF Backer Rod:

- Specification guide V2.0 March 2024

Masons Penetration Seals:

- Product brochure
- Durability appraisal

Masons WrapStrap™ House Wrap Strapping:

- Product brochure
- Specification guide

Masons Insulation Strap

- Product brochure

Manufacturer/supplier contact details

Company:	Masons NZ Limited
Web:	www.mpb.co.nz
Email:	specify@mpb.co.nz
Telephone:	0800 522 533

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For ~

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of purchase or dispatch from Masons NZ Ltd whichever is earlier.
- Provide the completed On-Site check sheets, where applicable.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS - GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 COMPLIANCE - CODEMARK CERTIFICATE CMNZ70072

Masons Barricade FR meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ70072.



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2 PRODUCTS

Masons Wall Underlays

2.1 MASONS UNI® FLEXIBLE AIR BARRIER

Absorbent, water-resistant, 180 GSM, synthetic wall underlay, comprising two outer layers of nonwoven polypropylene with a middle layer of a functional-technical film. CodeMark certified. The outer face is blue and marked “UNI® Flexible Air Barrier” or "UNI® SOFFIT" the underside is black.

Masons Flexible Air Barriers - Fastening Systems

2.2 MASONS UNI® FASTENERS FOR TIMBER FRAME

25mm galvanized or stainless steel ring shank nail fasteners with 32mm diameter plastic domed washer for use with a hammer, or with 25mm diameter plastic washer collated for use with the UNI (stinger) nailgun.

Masons Flashing Tapes & Corner Guards

2.3 MASONS 40 BELOW™ PLATINUM FLASHING

Self-adhesive flexible polyacrylic flashing tape with silver foil facing. Tape thickness 0.2mm, available in roll width 60mm - 230mm. 180days UV resistance. CodeMark certified, nail and screw sealability to AAMA 711-13.

2.4 MASONS 40 BELOW™ FLEX FLASHING TAPE

Self-adhesive flexible acrylic flashing tape with white facing. Tape thickness 0.2mm, available in roll width 75mm - 230mm. 270days UV resistance. CodeMark certified, single layer nail and screw sealability to AAMA 711-13.

2.5 MASONS HYDRO™ CORNER GUARDS

Flexible plastic mouldings for protection of wall underlay where dressed into openings in framing. Provides edge reinforcement of sills, for fixing flashing tape.

Masons Seam & Repair Tapes

2.6 MASONS UNI® FAB SEAM & REPAIR TAPE

Waterproof seaming tape with pressure-sensitive polyacrylic adhesive and a central filament layer of reinforcement. Available in roll form, 0.5mm thick x 60mm wide x 25m long. Black or white.

Masons Sealing & Underlay Accessories

2.7 MASONS PENETRATION SEALS

Flexible, conical moulded EPDM nozzle, on adhesive carrier base of flexible woven synthetic waterproof flashing. Available in 1mm - 75mm or 80mm - 170mm sizes. Trim to suit diameter of pipe penetration

2.8 MASONS WRAPSTRAP™ HOUSE WRAP STRAPPING

Blue embossed polythene strap, 19mm or 25mm wide.

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 GENERAL REQUIREMENTS

Design, application and installation of Masons NZ products to NZBC E2/AS1, NZBC E2/AS4, CodeMark™ certification, Masons NZ Limited technical literature and MRM Code of Practice.

3.4 INSPECT SUBSTRATE

Before starting work, ensure that the substrate will allow work of the required standard. Carry out remedial work identified prior to installation.

Application - Masons Wall Underlays

3.5 MASONS FLEXIBLE AIR BARRIERS - TIMBER FRAME

Fix horizontally as per Masons installation instructions, and NZBC E2/AS1, 9.1.6 Wall underlay, to outside face of framing (printed side facing out) in true alignment, with horizontal and vertical joins overlapping 150mm. Ensure underlay is taut and extends from upper side of top plate to a minimum of 50mm below the bottom plate or bearer. Fix using UNI® fasteners and optionally with timber cavity battens according to Masons installation and fixing guides. Keep clean and undamaged until closed in.

3.6 WALL OPENINGS

Run the underlay over opening and leave covered until windows and doors are ready to be installed. Form openings in the membrane, fold into the opening and fix to the framing. Cut off excess.

Follow Masons specified installation method, using flashing tape (Masons 40 Below™ Platinum / Flex) and Masons corner guard mouldings to provide a weathertight seal.
For UNI® PRO installations, or optionally for other UNI® applications, install Masons Dry Fix DPC up the jamb and under the head flashing.

3.7 EXPOSURE LIMIT AND TEMPORARY WEATHER PROTECTION

Install exterior cladding over Masons wall underlays as soon as practicable.

- Masons UNI® PLUS Flexible Air Barriers may be exposed to the weather & ultra-violet light for up to 90 days.
- Masons UNI® PRO Flexible Air Barrier may be exposed to the weather & ultra-violet light for up to 150 days

During this time, Masons wall underlays may be used as a temporary weather protection sheathing. Ensure all joins are sealed using Masons 40 Below Flashing tapes for UNI® PLUS or Masons 40 Below™ Platinum Flashing tape for UNI® PRO, and all penetrations sealed with Masons Penetration Seals. Roof cladding, soffit linings, windows and doors must be installed.

3.8 WEATHER CONDITIONS

When fixing the underlay in windy conditions, extra care must be taken due to the large sail area created by wide rolls.

3.9 REPAIR DAMAGE

Repair any damaged areas of the underlay, such as tears, holes or gaps around service penetrations. Repair damaged areas by covering with new material lapping the damaged area by at least 150mm and taping, or by taping small tears using appropriate Masons Seam and Repair Tape.

Application - Masons Flashing Tapes & Corner Guards

3.10 MASONS 40 BELOW™ FLASHING TAPES & CORNER GUARDS

Install Masons 40 Below™ Flashing Tape and if required, Corner Guards to NZBC E2/AS1, 9.1.4 Wall underlays to wall openings, for timber framing, or to NZBC E2/AS4, 9.1.5 for light steel framing and in accordance with Masons instructions.

3.11 FIXING OVER LOSP TIMBER

When applying Mason flashing tapes over LOSP treated timber, ensure the solvent has been allowed to flash off for a minimum of one week prior to the installation.

Application - Masons Seam & Repair Tapes

3.12 MASONS UNI® FAB SEAM & REPAIR TAPE

Install Masons UNI® FAB Seam and Repair Tape for lapped seams and repairs to:

- Masons UNI® and UNI® PLUS flexible air barriers

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- Masons VHP® roof underlays

all in accordance with Masons installation instructions.

Application - Masons Sealing & Underlay Accessories

3.13 MASONS PENETRATION SEALS

Install, in accordance with Masons installation instructions, select appropriately sized Masons Penetration Seals, and trim to suit pipe or wires penetrating wall underlay.

3.14 MASONS WRAPSTRAP™ HOUSE WRAP STRAPPING

Over wall underlay, install 19mm or 25mm wide WrapStrap horizontally at 300mm centres, draw taut and fix to studs with staples, screws or nails to prevent insulation bulging into cavity.

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

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

Masons Wall Underlays

4.1 MASONS UNI® FLEXIBLE AIR BARRIER

Location:	Exterior walls - refer drawings
Brand/Type:	Masons UNI® flexible air barrier
Order Code:	UNI2.74X50; UNISOFFIT

Masons Flexible Air Barriers - Fastening Systems

4.2 MASONS UNI® NAIL FASTENERS - TIMBER FRAME

Location:	Exterior walls
Frame type:	Timber
Brand/Type:	Masons UNI® Nail Fasteners
Fixing Type:	UNI Cap nails - loose, Galvanized steel 25mm long galvanized steel ring-shank nails and 32mm Ø plastic UNI washers (loose for hammer fixing). Order code: UNIFASTGN - Galv Nail & washer pack, 2500 pc. UNI Cap nails - collated,Galvanized steel 25mm long galvanized steel ring-shank nails and plastic washers, collated for UNI nailgun fixing. Order code: UNINAILPACK - Galv Nail & washer pack, 2000 pc.

Masons Flashing Tapes & Corner Guards

4.3 MASONS 40 BELOW™ FLASHING TAPE

Location:	Refer architectural drawings
Type / Brand	Either Masons 40 Below Flex or 40 Below Premium. As compatible with UNI Flexible Air Barrier.
Thickness:	0.3mm
Facer type:	Aluminium foil (Platinum) or Compound flexible white (Flex)

4.4 MASONS HYDRO™ CORNER GUARDS

Location:	Optional for 40 Below flashing tape installation except on UNI® PRO where they are required. Optional for Hydro flashing tape installations.
Corner Guards:	As required
Brand/Type:	Masons Hydro™ Corner Guards, blue plastic

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Masons Seam & Repair Tapes

4.5 MASONS UNI® FAB SEAM & REPAIR TAPE

Location:	Where required Use for sealing lapped joints and repairs to Masons VHP® roof underlays, Masons UNI® and UNI® PLUS flexible air barriers.
Brand/Type:	Masons UNI® FAB Seam & Repair Tape
Thickness:	0.5mm approx.
Colour:	White
Roll size: (W x L)	60mm x 25m
Order code:	UNISEAMTPE60MM

Masons Sealing & Underlay Accessories

4.6 MASONS PENETRATION SEALS

Location:	Penetration seals refer drawings
Brand/Type:	Masons Penetration Seals

4.7 MASONS WRAPSTRAP™ HOUSE WRAP STRAPPING

Location:	If required
Brand/Type:	Masons WrapStrap™ house wrap strapping

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4165DV DRISPACE ROOF VENTILATION & WALL VENTED CAVITY BATTEN

1 GENERAL

This section relates to the supply and installation of DriSpace VENT roof and wall ventilation systems.

It includes:

- Ventilated Wall Cavity Batten
- Ventilated Roof Products

1.1 RELATED WORK

Refer to 4161TH DRISPACE UNDERLAYS, DPC & AIRTIGHT SYSTEMS for roof and wall underlays.

Documents

1.2 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC C/VM1	Protection from fire
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
BRANZ Appraisal 979 Roof Ventilation Products
BRANZ Appraisal 1099 (2024) - Vent Ventilated Wall and Drainage Cavity Batten

Roof Ventilation Design Guide for all roof pitches
VENT Passive Ventilation System - brochure
VENT Product Technical Sheets - for various products
ProctorPassive HC9 Drainage Mat - Product Technical Statement

Manufacturer/supplier contact details

Company:	DriSpace (a division of TCL Hunt Ltd)
Web:	www.drispace.co.nz
Email:	sales@drispace.co.nz technical@drispace.co.nz
Telephone:	0800 DRISTUD (0800 374 7883)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For durability of DriSpace ventilation products

- Provide this warranty on the TCL Hunt Warranty for DriSpace Products standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT).
- Refer to TCL Hunt Warranty for DriSpace Products warranty form for conditions and limitations of warranty.
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials

2.1 VENT VB20 VENTILATION AND DRAINAGE ROOF BATTEN

VENT VB20 Ventilation and Drainage Roof Batten, a 45mm wide x 20mm thick x 1800mm long batten manufactured from extruded polypropylene with peel-off adhesive backing with 4mm vents that provide passive air flow of 16,000mm² per lineal metre. Used to provide ventilation and drainage for skillion roof cavities.

2.2 VENT VB10 VENTILATION AND DRAINAGE ROOF BATTEN

VENT VB10 Ventilated and Drainage Roof Batten, a 45mm wide x10mm thick x 1800mm long batten manufactured from extruded polypropylene with peel-off adhesive backing and with 4mm vents that provide passive air flow of 8,000mm² per lineal metre. Use to provide ventilation and drainage between the roof underlay and steel longrun roofing mitigating dew point condensation.

2.3 VENT G1200N & G2500N OVER FASCIA VENT - ROOF

VENT G1200N & G2500N Over Fascia Vents are manufactured from extruded polypropylene with 4mm vents that provide passive air flow 10,000mm² per lineal metre for G1200N and 25,000mm² per lineal metre for G2500N. Supplied in 1000mm lengths, black colour.

2.4 VENT RV10P & RV10DT, ROOF RIDGE VENT / APRON VENT

VENT RV10P & RV10DT Ridge Vents, manufactured from extruded polypropylene with an aluminium-based conformable, soft edge flashing along the bottom edge and provides passive air flow of 8,000mm² per lineal metre. VENT RV10P is 410mm wide (including flashing) x 20mm thick x 1200mm long lengths, to suit trough depths that are less than 34mm and VENT RV10DT is 460mm wide (including flashing) x 20mm thick x 1200mm long lengths, to suit trough depths between 34mm and 60mm. RV10P & RV10DT can be used as an Apron Vent, for abutments and barges, by cutting RV10P & RV10DT in half lengthwise.

Components

2.5 FIXINGS - ROOF BATTEN VB20 FIXING

40 x 2.5mm hot-dip galvanized flat head nails or hot-dip galvanized or stainless steel finishing brads.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out remedial work identified before installing VENT products.

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3.4 CONDITIONS - PREVENTION OF FIRE

Separation or protection must be provided to the VENT products from heat sources such as fire places, heating appliances, flues and chimneys. Refer to NZBC C/AS1-AS2 and NZBC C/VM1 for requirements.

3.5 CONDITIONS - SITE EXPOSURE

Do not expose VENT propylene products to weather or ultra-violet light for a prolonged periods of time, especially G502 Roll Panel Vent (Ventilated Eaves Baffle) which should be covered on the same day as installation.

Installation/application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - Roof

3.7 INSTALL VENT VB20 VENTILATION AND DRAINAGE ROOF BATTEN

Install VENT VB20 Ventilation and Drainage Roof Batten to the manufacturer's requirements prior to the installation of roof underlay.

Remove peel-off backing to battens and temporarily fix to the top of the purlins. Fix with 40 x 2.5mm hot-dip galvanized flat head nails or hot-dip galvanized / stainless steel finish brads at approximately 400mm centres. Battens maybe cut with a knife, handsaw or drop-saw.

3.8 INSTALL OVER FASCIA VENT - ROOF

Install selected Over Fascia Vent to the manufacturer's requirements to the top of fascia board prior to the installation of roofing underlay. Fix in place using screws or nails through the fixing holes provided.

3.9 FIX ROOF UNDERLAY

Refer to relevant underlay section for installation.

3.10 INSTALL VENT VB10 VENTILATION AND DRAINAGE ROOF BATTEN

Install VENT VB10 Ventilation and Drainage Roof Batten to the manufacturer's requirements after the installation of roof underlay.

Remove peel-off backing to battens and temporarily fix over underlay to the top of the purlins. Battens maybe cut with a knife, handsaw or dropsaw. The battens are fixed by the roof cladding fixings which will penetrate the roof framing.

3.11 INSTALL ROOF RIDGE VENTS & ROOF APRON VENTS

Install selected VENT Ridge to the manufacturer's requirements after the installation of roof cladding but prior to the installation of flashings. Cut ridge vents in half lengthwise to use as apron vents.

Lay in position over the top of roof cladding, remove peel-off backing and temporary fix in place, if required screw at each corner to ensure the underside of vent is flat against the roof.

Ensure all moisture and dust are removed from roof before dressing down the aluminium soft edge, notch or snip to suit roofing profile.

Completion & Commissioning

3.12 COMPLETION MATTERS

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

4 SELECTIONS

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

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Materials

4.1 VENT VB20 VENTILATION AND DRAINAGE ROOF BATTEN

Location:	Refer drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	VENT VB20 - Ventilation and Drainage Roof Batten
Size:	45mm wide x 20mm thick x 1800mm long
Fixings:	Self-adhesive backing (temporary fix) & 40 x 2.5mm hot-dip galvanized flat head nails at approximately 400mm centres

4.2 VENT VB10 VENTILATION AND DRAINAGE ROOF BATTEN

Location:	Refer drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	VENT VB10 - Ventilation and Drainage Roof Batten
Size:	45mm wide x 10mm thick x 1800mm long
Fixings:	Self-adhesive backing (temporary fixing)

4.3 VENT OVER FASCIA VENT

Location:	Refer drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	G1200N Over Fascia Vent - for - for trussed roofs with pitches >15° G2500N Over Fascia Vent - for trussed roofs with pitches >15°
Colour:	Black
Fixings:	Nail or screw in place

4.4 VENT RIDGE VENT / APRON VENT

Location:	Refer drawings
Supplier:	DriSpace
Manufacturer:	Blue Building Solutions Ltd (T/A VENT)
Type/Brand:	VENT RV10P, Ridge Vent - to suit trough depths less than 34mm
Size:	mm wide (including flashing) x 20mm thick x 1200mm long lengths VENT RV10P, Ridge Vent - 410mm wide
Fixings:	Self-adhesive backing (& if required screw at each corner)

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4221HV HERMPAC VERTICAL WEATHERBOARD CLADDING SYSTEM

1 GENERAL

This section relates to the supply and fixing of **Hermpac** Vertical cladding:

- Vertical Shiplap weatherboards
- Board and Batten weatherboards
- Fascia
- Mouldings
- Proprietary flashing systems
- Vertical Shiplap 'Vertibat' cavity batten systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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 E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
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

JAS-ANZ CodeMark Certification CMNZ30036 - Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Hermpac Construction Drawings

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System installation Specifications
Hermpac Vertical Shiplap Weatherboard Direct Fix System Installation Specifications
Hermpac Product Technical Statement (PTS) – VertiLine Vertical Shiplap Weatherboard Cavity System (July 2023)
Hermpac Product Installation Checklist – VertiLine Vertical Shiplap Weatherboard Cavity System (Jan 2023 V2)

Hermpac Board and Batten Weatherboard Cavity System Installation Specifications
Hermpac Board and Batten Weatherboard Direct Fix System Installation Specifications
Hermpac Product Technical Statement (PTS) – Board and Batten Weatherboard Cavity System (July 2023)
Hermpac Product Installation Checklist – Board and Batten Weatherboard Cavity System (Jan 2023 V2)

Hermpac Standard and Custom profiles
Hermpac Profile Portfolio
Hermpac Grade descriptions
Hermpac Nail/Screw fixings
Hermpac Legal and / or Sustainable Certification
Machinecoat - Flood Coat Inundation versus Spray Application
Maintenance of selected Wood Oil/Oil Based Stain Finishes
Hermpac WRC Information Sheet – cuts and characteristics
Hermpac WR & Yellow Cedar cuts and characteristics

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BRANZ Appraisal 650 - Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

Manufacturer/supplier contact details:

Company:	ITI NZ Limited
Trading as:	Hermpac by ITI
Contacts:	Kyle Deans - 021 771 857, kyled@iti.net.nz
	Carmen Hansen - 027 809 4588, carmenh@iti.net.nz
Web:	www.hermpac.co.nz
Email:	technical@hermpac.co.nz
Telephone:	09 421 9840

Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years For installation of Hermpac vertical weatherboard cladding systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Compliance information

1.6 CODEMARK CERTIFICATE

Hermpac vertical weatherboard cladding systems meet the requirements of the NZBC when used within the Conditions and Limitations of their Certificate CMNZ30036.

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.8 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.

1.9 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To NZBC B2 Durability provisions for building elements and NZBC E2/AS1.

2 PRODUCTS

Materials

2.1 WESTERN RED CEDAR

Hermpac Canadian Western Red Cedar (Thuja plicata) supplied from sustainably managed forests of British Columbia, Canada and available with PEFC or FSC certification.

2.2 VERTICAL SHIPLAP / VERTICAL BOARD AND BATTEN

Weatherboards to Hermpac profiles, Lap and Rebate details to BRANZ BU 411 and general design to the NZS 3617, species and grading to NZS 3602, table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in lengths relevant to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position.

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Acceptable Solution is limited to the following types of weatherboards and their derivatives:

- Vertical Standard Shiplap and Hermpac Custom Profiles
- Vertical Standard Board and Batten and Hermpac Custom Profiles

A selection of the above profiles are also available in Western Red Cedar and Yellow Cedar finger-joint (CedarOne Evolve and CedarLine Evolve). CedarOne Evolve is quarter-sawn cut Cedar. CedarLine Evolve is primarily flat-sawn cut Cedar. Evolve profiles are available across most standard and custom profiles. The timber is machined with a “combed” finish to the front face and the boards are finished with an oil or stain as per Hermpac literature.

Regular paint finish finger-joint (CedarOne Mantle and CedarLine Mantle) is also available in Western Red Cedar and Yellow Cedar. Profiles are machined with a “dressed” finish to the front face and the exposed corners are machined to paint quality - PQ (ie. rounded edges for paint adherence). Boards are supplied pre-primed and undercoated, sanded and/or de-nibbed/buffed between coats.

2.3 COVER BOARDS, SMART CORNERS, MOULDINGS AND SCRIBERS

To Hermpac profiles as detailed, with species and grading to NZS 3602, but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.4 FASCIA BOARDS

To Hermpac profiles, with species and grading to NZS 3602, but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.5 WALL UNDERLAYS

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

2.6 VERTIBAT PINE EXTERIOR CAVITY WALL BATTENS - NON STRUCTURALLY FIXED

Vertibat Radiata Pine, H3.1 and H3.2 treated castellated and double bevelled cavity battens, available in a range of sizes. Refer to SELECTIONS.

2.7 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Aluminium, PVC or stainless steel cavity closure strip, punched with 3mm-5mm holes or slots to provide a minimum ventilation opening area of 1000mm² per lineal metre of wall. Length and width to suit cavity. To NZBC E2/AS1, paragraphs 9.1.7.5 - 9.1.7.7, and Figure 9.1.7.4A: Cavity base closer/vermin proofing.

Components

2.8 NAILS, SILICON BRONZE

Hermpac Crown, Rose or Flat Head, Annular Grooved Silicon Bronze fixings to NZBC E2/AS1, Table C.3.1.1: Fixing selection for wall claddings. Refer to Hermpac Construction Drawings for fixing details and to SELECTIONS for fixing sizes.

2.9 NAILS, STAINLESS STEEL

Hermpac Crown, Rose or Flat Head, Annular Grooved Grade 316 Stainless Steel fixings to NZBC E2/AS1, Table C.3.1.1: Fixing selection for wall claddings. Refer to Hermpac Construction Drawings for fixing details and to SELECTIONS for fixing sizes.

2.10 SCREWS, STAINLESS STEEL

Hermpac Starcap Grade 316 Stainless Steel fixings to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact. Refer to Hermpac Construction Drawings for fixing details and to SELECTIONS for fixing sizes and colours.

2.11 JOLT HEAD NAILS, STAINLESS STEEL

Hermpac Jolt Head, Annular Grooved Grade 316 Stainless Steel fixings to NZBC E2/AS1, Table C.3.1.1: Fixing selection for wall claddings. Refer to Hermpac Construction Drawings for fixing details and to SELECTIONS for fixing sizes.

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2.12 CLINCH NAILS, STAINLESS STEEL

Hermpac proprietary 40 x 2.0mm, 50 x 2.0mm and 27 x 2.0mm Clinch Nail, Annular Grooved Grade 316 Stainless Steel.

2.13 FLASHINGS GENERALLY

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: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

2.14 SEALANT

Polyurethane or silane terminated polymers (PU-hybrid technology) construction sealant.

Finishes

2.15 FACTORY PRE-FINISHING - MACHINECOAT (NZ) - MIGRATING WOOD OIL / OIL BASED STAIN

Flood Coat Inundation: Factory application of selected oil-based stain finishes by flood inundation and enhanced penetration of timber surface by roller pressure and fibre saturation.

Refer to: www.hermpac.co.nz/our-products/coatings

Wood X Oil:	Migrating wood oil - exclusive Machinecoat (NZ) factory formulation, standard and custom colour range.
Wood X Stain:	Penetrating stain - exclusive Machinecoat (NZ) factory formulation, standard and custom colour range.
Resene:	Machinecoat (NZ) Woodsman Natural Wood Oil - exclusive pigment and fungicide enriched factory formulation.

2.16 SITE APPLIED WOOD OIL/OIL BASED STAIN & PAINTS

All Hermpac weatherboard cladding systems will arrive on site with a minimum of one coat factory finish. Additional coat/s will be required to achieve the desired look. Ensure site coating applications are to coating manufacturers specifications. All Hermpac weatherboards and mouldings must be coated with a specified coating system on all bare surfaces and ends must be minimum double sealed prior to installation. 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.

Timber framing moisture content: 20% maximum

Application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 APPLICATION GENERALLY

Application in accordance with Hermpac Installation Specifications.

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Application - preparation

3.6 SITE STAINING - WOOD OIL/OIL STAIN FINISH

If not pre-finished before delivery, prepare and coat all faces and edges with one coat of premium wood oil or oil stain to coating manufacturers specifications immediately on opening block stack. Once coated, open stack each board to dry (or penetrate) with back facing downwards ensuring faces remain well finished, untouched and unblemished during drying. Once the coating is dry (Resene Woodsman) or penetrated (Wood-X wood oil), stack the boards face to face and back to back in subsequent layers, so as not to damage the face and finish. Keep dry and undamaged.

Apply a second coat to the boards once they have been installed if using Wood-X or a second and third additional coat if using Resene Waterborne Woodsman. Coating timeframes for oils/stains will vary. Check timeframe requirements for the second or third coats with the coating manufacturer.

Application - vertical cladding over cavity battens

3.7 VERTIBAT PINE DRAINED CAVITY / NON STRUCTURALLY FIXED

Install 20mm minimum thickness drained cavity. Fit Vertibat cavity battens horizontally over wall underlay to wall framing, centred over nogs at 400mm - 480mm vertical centres with top edge sloping away from wall underlay and nail tack in place.

3.8 CAVITY CLOSER / VERMIN PROOFING

Refer to Hermpac Cavity System Installation Specification. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Use cavity spacers where fixing is required between cavity battens.

3.9 PENETRATIONS

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

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

Hermpac Construction Drawings call for a compressible bond breaker, closed cell PVC foam seal to NZBC E2/AS1, paragraph 9.1.9.9.

3.10 SET-OUT

Use a string line, laser or mechanical device to set out all fixing that will be visible in the finished work. Align accurately in straight lines. Refer to relevant Hermpac Installation Specification and Construction Drawings to establish correct angle of fixing and consistent, accurate placement relative to visible edge of board. For vertical shiplap boards, where possible the exposed lap should face away from the prevailing wind.

Application - fixing

3.11 FIXING - OIL / STAIN FINISH

Install level, true to line and face, to NZBC E2/AS1, 9.4 Timber weatherboards. Double coat all cut ends before fixing. Provide one face fixing per weatherboard at each Vertibat cavity batten over nogging or structurally fixed cavity batten location. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Finish the heads of Hermpac Crown, Rose and Flat head nails, or Hermpac Starcap screws, flush onto and not into the board surface. Do not over drive the nail/screw head and crush the timber surface beneath and surrounding the nail/screw.

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3.12 FIXING/FINISH - WIND ZONE

Hermpac Western Red Cedar, Yellow Cedar or DuraLarch™ weatherboards fixed with Stainless Steel or Silicon Bronze Hermpac Crown, Rose and Flat Head nails or Hermpac Starcap screws and Kanda weatherboards fixed with Hermpac Starcap screws are limited to use in NZS 3604 Wind Zones up to and including Extra High when dwangs or structurally fixed Vertibat cavity battens are at maximum 480mm centres.

Hermpac Western Red Cedar weatherboards fixed with stainless steel jolt head nails are limited to use in NZS 3604 Wind Zones up to and including Medium when dwangs or structurally fixed Vertibat cavity battens are at maximum 480mm centres, and NZS 3604 Wind Zones up to and including Very High when dwangs or structurally fixed Vertibat cavity battens are at maximum 400mm centres.

Hermpac Yellow Cedar and DuraLarch™ weatherboards fixed with jolt head nails are limited to use in NZS 3604 Wind Zones up to and including Extra High when dwangs or structurally fixed Vertibat cavity battens are at maximum 480mm centres.

Refer to Hermpac Construction Drawings for fixing details and to SELECTIONS for fixing sizes.

3.13 FIXING BOARD AND BATTEN

Install level, true to line and face, to NZBC E2/AS1, 9.4 Timber weatherboards. Face fix in the centre of the board width (nogs or dwangs at minimum 400 centres to maximum 480mm centres). Fixing to be driven in with a slightly upward slope. Line fixings horizontally across the boards. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry.

Using a Hermpac 50 x 2.0mm speciality clinch nail, restrain both hidden board edges by driving the clinch nail positioned hard up against the board edge but not into the board. Drive the clinch nail into the cavity batten so that the clinch head settles flush into the board surface, prior to the weatherboard batten being fixed over top (nogs or dwangs at maximum 480mm centres).
Do not pin boards or battens.

Space boards with a 6-8mm gap for correct alignment of battens over each board beneath. Face fix the centre of the batten with a single fixing through the gap between boards at every fixing point. Fixing to be driven in with a slightly upward slope. Line fixings horizontally across the battens and boards.
NB: One fixing in the centre of each board and one fixing in the centre of each batten at each fixing point.

Refer to Hermpac Construction Drawings and Installation Specification for suitable face fixings (options include Hermpac Silicon Bronze nails or Grade 316 Stainless Steel nails or Starcap screws. Kanda weatherboards are fixed with Hermpac Starcap screws), correct placement of fixings, size, length and minimum penetration requirements, and for external and internal corner construction and fixing details.

3.14 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1.

3.15 APPLYING SEALANT TO BACK FLASHINGS & WEATHERBOARDS - SIKA

Wipe weatherboard surfaces with a clean rag. Using an abrasive pad, rub down back flashings in a single pass before cleaning with surface activator. Apply primer to flashings and back of weatherboards. Apply a continuous 5mm bead of adhesive to back flashing prior to fixing weatherboards.

3.16 COMPLETE

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

Completion & Commisioning

3.17 COMPLETION MATTERS

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

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4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise. Contact technical@hermpac.co.nz for assistance or more information.

4.1 HERMPAC WESTERN RED CEDAR CERTIFIED SUSTAINABLE TIMBER

Product:	Hermpac Western Red Cedar products
Certification type:	PEFC
Timber species:	Western Red Cedar (Thuja plicata)
Origin:	British Columbia, Canada
Claim:	100% PEFC Origin

4.2 SELECTED TIMBER VERTICAL SHIPLAP WEATHERBOARD

Location:	Refer architectural drawings
Species:	Western Red Cedar
Grade:	HERMPAC Premium Clears No.1 (PC1)
Profile Number/Series:	HP55 or similar approved.
Profile type:	Vertical Shiplap
Cover dimensions:	110mm
Thickness:	18.5mm
Cavity Fixing system:	Over 20mm drained cavity
Surface finish:	Band Sawn Face (BSF)
Moisture content:	≤18 % at fixing

4.3 HERMPAC CORNER MOULDS, COVER BOARDS, BOXED CORNERS & SCRIBERS

Location:	Refer drawings
Species:	Western Red Cedar
Grade:	HERMPAC Premium Clears No.1 (PC1)
External Corner Mould:	Refer drawings
Internal Corner Mould:	Refer drawings
Cover boards:	HP 201 and HP 202
Scriber:	HP11 - HP18
Surface finish:	Band Sawn Face (BSF)
Moisture content:	≤18% at fixing

4.4 WEATHERBOARD FASTENINGS - SILICON BRONZE NAILS - WOOD OIL / OIL STAIN FINISH

Nails:	Crown Head
Type:	Silicon Bronze
Size:	Refer to Hermpac literature for size and location of fixing.

4.5 WEATHERBOARD FASTENINGS - STAINLESS STEEL SCREWS - WOOD OIL / OIL STAIN FINISH

Screws:	Hermpac Starcap
Type:	Grade 316 stainless steel
Colour:	Bronzed
Size:	Refer to Hermpac literature for size and location of fixing

4.6 LAP FASTENINGS - CLINCH NAILS

Nails:	Clinch nails
Type:	Grade 316 stainless steel
Size:	Size options include 40mm, 50mm and 27mm.

4.7 VERTIBAT PINE CAVITY BATTENS - NON STRUCTURALLY FIXED

Product:	Vertibat (V1)
Material:	H3.2 Micropro Radiata Pine
Size:	45mm wide x 20mm thick x 2700mm long
Fixings:	Flat head nails
Fixing size:	40mm x 2.0mm

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4.8 HERMPAC CAVITY CLOSER/VERMIN-PROOFING

Brand/type:	Sigma cavity closure
Material:	Aluminium

4.9 HERMPAC INTERNAL AND EXTERNAL CORNER BACK FLASHINGS

Material:	Aluminium
Size:	To suit specified corners
Length:	2.4m or 3.0m length
Type:	Unhemmed

4.10 FACTORY FINISH - WOOD OIL / OIL STAIN - FLOOD COAT INUNDATION

Brand:	Machinecoat (NZ) Ltd
Product:	Wood-X penetrating wood oil
Coating process:	Machinecoat (NZ) Ltd. Flood Coat Inundation
Colour:	To be confirmed
Factory coats:	One
On site coats:	One, or as per coating manufacturers specification

4.11 SITE FINISH - PENETRATING WOOD OIL / OIL STAIN

Brand:	Wood-X penetrating wood oil
Colour:	To be confirmed
On site manual coats:	Refer Manufacturers specifications

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4224 TRIM - EXTERIOR TIMBER

1 GENERAL

This section relates to lengths of timber fixed on site, either associated with timber cladding, or used as isolated trim with other wall cladding or soffit materials:

- Exterior trim

Documents

1.1 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 3604	Timber-framed buildings

2 PRODUCTS

Materials

2.1 TIMBER TRIM

To NZS 3602, treated H3.1 unless durable heart wood, to profiles detailed/scheduled.

2.2 PROPRIETARY TIMBER TRIM

To NZS 3602, treated H3.1.

Components

2.3 NAILS, GALVANIZED

60mm x 2.8mm galvanized steel wire jolt/flat/raised head generally. Use other sizes to suit profiles being fixed.

2.4 NAILS, STAINLESS STEEL

60mm x 2.8mm stainless steel wire jolt/flat/raised head generally. Use other sizes to suit profiles being fixed, refer to Man Lit

Finishes

2.5 PRIMER

Water borne acrylic or solvent borne oil-alkyd primer to suit the timber and proposed painting system.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of trims undamaged and unmarked and store on site flat and true, under cover, and clear of areas where work is in progress, to ensure materials are of the required standard when fixed in place.

3.2 SUBSTRATE

Ensure that the substrate to trims will allow work of the required standard. If it does not, do not proceed until the substrate has been rectified.

Application - preparation

3.3 PRIMING AND SEALING

If not pre-finished before delivery, coat all faces and edges immediately. Then fillet stack trim until fixed. Keep dry and undamaged. Coat to suit the paint system specified in painting section/s. Allow to re-coat if exposed for more than one month before the final coating is applied.

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Application

3.4 EXECUTION

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

3.5 TIMBER TRIM

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

3.6 NAILING, PAINT FINISH

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

Completion

3.7 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.8 PROTECTION

Protect the completed work and make good before any surface finish is applied.

3.9 REPLACE

Replace all damaged or marked elements.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Cladding Trim Components

4.1 H3.1 TIMBER - PLANTED SILL

Location:	Refer to the drawings and documentation - specifically to doors and windows
General:	Refer to the details for Intent, set out and type
Profile:	Linea Sill SB 65X38 or equal approved
Treatment:	H3.1
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails and or to the manufacturer recommendations and specifications
Moisture content:	18% at fixing
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Paint LVL:	The contractor is to liaise with the painting subcontractor to ensure that the correct LVL (light reflectance values) values are meet for each exterior element. We draw your specific attention to the Timber weatherboards. Please confirm with the manufacturers literature that the selected paint colour meets the LVL requirements for these specific products to ensure that the warranty is not voided.

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4.2 H3.1 TIMBER - FACING 90 X 19

Location:	Refer to the drawings and documentation - specifically to doors and windows
General:	Refer to the details for Intent, set out and type
Profile:	90w x 19d facing profile or equal approved - refer to details for intent
Treatment:	H3.1
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails and or to the manufacturer recommendations and specifications
Moisture content:	18% at fixing
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Paint LVL:	The contractor is to liaise with the painting subcontractor to ensure that the correct LVL (light reflectance values) values are meet for each exterior element. We draw your specific attention to the Timber weatherboards. Please confirm with the manufacturers literature that the selected paint colour meets the LVL requirements for these specific products to ensure that the warranty is not voided.

4.3 H3.1 TIMBER - SCRIBER

Location:	Refer to the drawings and documentation - specifically to box corners, junctions, doors and windows
General:	Refer to the details for Intent, set out and type
Profile:	60mm x 18mm x 6mm radius (and or as required to suit cladding profiles and set outs)
Treatment:	H3.1
Fixing:	To the minimum requirements of NZS 3604 (Current ED.) and table 8.19 Nailing schedule for hand and power driven nails and or to the manufacturer recommendations and specifications
Moisture content:	18% at fixing
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Paint LVL:	The contractor is to liaise with the painting subcontractor to ensure that the correct LVL (light reflectance values) values are meet for each exterior element. We draw your specific attention to the Timber weatherboards. Please confirm with the manufacturers literature that the selected paint colour meets the LVL requirements for these specific products to ensure that the warranty is not voided.

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4231HI JAMES HARDIE EXTERNAL FIRE & ACOUSTIC WALL SYSTEMS

1 GENERAL

This section relates to the supply and installation of

- **James Hardie** two way, external/internal, fire and acoustic rated load bearing wall systems for timber and steel framed buildings.
- **James Hardie** two way fire rated parapet and wing walls.

Each system includes;

- framing
- cladding
- lining
- insulation
- underlay
- associated components and accessories necessary to complete the system

1.1 RELATED WORK

Refer to related James Hardie cladding section.

Refer to related framing section.
Refer to related insulation section.
Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlay
Refer to 5171G GIB® PLASTERBOARD FIRE & SOUND LININGS for fire rated and acoustic linings.

1.2 ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

FRR	Fire resistance rating
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 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 1530.2	Methods for fire tests on building materials, components and structures - Part 2: Test for flammability of materials
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Part 5: Earthquake actions - New Zealand
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Fire and Acoustic Design Manual by James Hardie, May 2025
Bracing Design Manual by James Hardie
GIB® Fire Rated Systems

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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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER OR SYSTEM

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie products
15 years:	For accessories supplied by James Hardie (refer to James Hardie product warranty)
10 years	For all GIB® products and systems installation (refer to Winstone Wallboards product warranty)

- Provide warranty on the manufacturer's standard form/s.
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie maintenance requirements at completion of the work. Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the information.

Performance

1.10 FIRE RATING REQUIREMENTS

Provide the James Hardie fire rated system. Refer to SELECTIONS for system FRR details.

1.11 SOUND INSULATION REQUIREMENTS

Refer to SELECTIONS for system details and required STC ratings.

1.12 BRACING REQUIREMENTS

Refer to Bracing Design Manual by James Hardie for bracing requirements combined with the fire and acoustic systems.

Compliance information

1.13 COMPLIANCE - BRANZ APPRAISAL

James Hardie External Fire & Acoustic Wall Systems have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of BRANZ Appraisal 1285.

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Quality control and assurance

1.14 INSPECTIONS

As required by BCA

2 PRODUCTS

Materials - general

2.1 TIMBER FRAMING

Refer to appropriate timber framing section.

2.2 FLEXIBLE UNDERLAY

Flexible underlay that complies with NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, with a flammability index not exceeding 5 when tested to AS 1530.2. Refer to the appropriate separate section(s).

2.3 RIGID AIR BARRIER

Refer to section 4171HR JAMES HARDIE RIGID AIR BARRIERS for RAB™ Board.

2.4 INSULATION - GLASS WOOL

Refer to the appropriate separate insulation section(s). Glass wool insulation minimum R2.2 and density 12-18 kg/m3

2.5 INSULATION - HARDIE™ MINERAL INSULATION

Hardie™ Mineral insulation, 90mm thick, R 2.74m²K/W, density 80kg/m3.

2.6 TIMBER CAVITY BATTENS

Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.7 HARDIE™ HORIZONTAL TIMBER CAVITY BATTENS

Radiata pine battens as packers, minimum 45mm wide x 20mm thick with bevelled edge and purpose cut rebates for drainage and ventilation, H3.1 treated to NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.8 HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Hardie™ CLD™ Structural Cavity battens, 70mm wide x 19mm thick and 2450mm long, fully sealed on all faces. Manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2.

Components - cladding/lining

2.9 JAMES HARDIE FIBRE CEMENT CLADDING

Refer to SELECTIONS for type. Refer to relevant James Hardie cladding section.

2.10 NON JAMES HARDIE CLADDING

Refer to SELECTIONS and relevant cladding section.

2.11 GIB® PLASTERBOARD LINING

GIB Fyreline®, fire resistant plasterboard to AS/NZS 2588. Refer to 5171G GIB® PLASTERBOARD FIRE & SOUND LININGS for GIB Fyreline®. Refer to SELECTIONS for thickness.

2.12 FIXINGS - JAMES HARDIE CLADDING/LINING

Refer to Fire and Acoustic Design Manual by James Hardie system description, James Hardie product technical specification/installation manuals for its fixings.

2.13 POST FIRE STABILITY - ANCHOR

Pryda® Brace Anchor or GIB Handibrac® with Ramset Ankascrew M12 x 150mm for concrete and M12 x 150mm Coach screw for timber. Gib Quiet Tie for intertenancy walls.



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2.14 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.

Accessories

2.15 COATINGS AND FINISHES

Refer to relevant James Hardie technical literature for the cladding system selected.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 FRAMING - GENERAL

Ensure framing sizes and set-out suit the selected fire and acoustic rated wall system, plumb, level and in true alignment.

Moisture content of timber framing: % maximum to NZS 3602

3.5 TIMBER FRAMING - NZS 3604

Refer to appropriate TIMBER FRAMING section. Timber framing to NZS 3604 and selected James Hardie fire and acoustic system requirements.

3.6 TIMBER FRAMING - SPECIFIC ENGINEERING DESIGN

Refer to appropriate TIMBER FRAMING section. Timber framing to specific engineering design (SED) to AS/NZS 1170.2, NZS 1170.5 and NZS 3603 and to selected James Hardie fire and acoustic system requirements.

Application - general

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 BOUNDARY WALL - POST FIRE STABILITY

Ensure timber bottom plate and studs are fixed using Pryda® Brace Anchors or GIB Handibrac® on each side of the stud to James Hardie installation instructions.

3.9 HARDIE™ MINERAL INSULATION

Fit pre-cut Hardie™ Mineral Insulation tightly in framing cavities to achieve a tight friction fit. If cutting is required ensure that insulation is tightly fitted in each direction.

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3.10 GLASS WOOL INSULATION

Refer to related insulation section.

3.11 FLEXIBLE UNDERLAY

Refer to the appropriate separate section(s).

3.12 RIGID AIR BARRIER

RAB™ Board fixed to all framing with fixings at 150mm centres maximum and joints taped as per James Hardie HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

3.13 CAVITY CONSTRUCTION

Install to James Hardie cavity construction installation instructions for the specified cladding material. Cavity must not open into the roof space or subfloor space. Refer to Fire & Acoustic Design Manual by James Hardie construction details.

3.14 CONTROL JOINTS

Horizontal control joints in claddings to be provided at all floor joist levels to the relevant James Hardie product technical specification. Vertical control joints must be installed to James Hardie product technical literature.

3.15 CONTROL OF EXTERNAL FIRE SPREAD

Ensure flashings and continuous horizontal cavity battens are installed to James Hardie product technical literature, to prevent fire spread within the cavity.

3.16 JAMES HARDIE FIBRE CEMENT CLADDING/LINING LAYOUT AND FIXINGS - GENERAL

Refer to Fire and Acoustic Design Manual by James Hardie and Cladding technical specification for system fixing requirements.

3.17 NON JAMES HARDIE CLADDING LAYOUT AND FIXINGS - GENERAL

Refer to related CLADDING section.

3.18 GIB FYRELINE® LINING

Select GIB Fyreline® thickness in accordance with James Hardie fire rated system specification. Install the GIB Fyreline® products as per Winstone wall board technical literature.

3.19 STRUCTURAL STEEL MEMBERS IN FIRE RATED WALL

Independently fire rate structural steel members inside the fire rated wall cavity. Refer to appropriate STEELWORK FIRE RATED COATINGS section for intumescent paints.

Completion & Commissioning

3.20 COMPLETION MATTERS

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

3.21 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS

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

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External timber framed fire & acoustic rated wall system

4.1 JAMES HARDIE FRR 30/30/30 SYSTEM - EXTERNAL TIMBER FRAMED WALL JHETGR30-N

Location:	Refer drawings
Brand:	James Hardie Fire & Acoustic system
System #:	JHETGR30-N
FRR:	30/30/30
STC:	43
Cladding:	Refer drawings
Cavity batten:	20mm timber
Underlay:	5mm RAB
Framing size:	Refer drawings
Insulation:	To match external insulation
Lining type:	10mm GIB Fyreline®

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4231HO JAMES HARDIE® OBLIQUE™ WEATHERBOARD CLADDING

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FRR	Fire resistance rating

Documents

1.3 DOCUMENTS

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

NZBC 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
NZBC E2/VM1	Cladding systems of buildings up to 10 m in height – including junctions with windows, doors and other penetrations
AS/NZS 1170.2:2011	Structural design actions - Wind loads
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
CodeMark™ CMNZ30147 - ver C	Oblique™ Weatherboard by James Hardie® Cavity Cladding System

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Oblique™ Weatherboard Horizontal Installation Technical Specification (March 2026)
Oblique™ Weatherboard Vertical Installation Technical Specification (March 2026)
Oblique™ Weatherboard Vertical Installation to Hardie™ 40mm Structural Horizontal Cavity Batten Technical Specification (March 2026)
Fire and Acoustic Design Manual by James Hardie, May 2026
James Hardie® Installation Checklist
BRANZ Appraisal 1231 (2022) - Oblique™ Weatherboard (Horizontal) Cavity Cladding - amended 31 March 2026
BRANZ Appraisal 1232 (2022) - Oblique™ Weatherboard (Vertical) Cavity Cladding - amended 31 March 2026
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

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 SAFE WORKING

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
Oblique™ Weatherboard Care and Maintenance guide.

Provide this information prior to practical completion.

1.10 OBLIQUE™ WEATHERBOARD INSTALLATION CHECKLIST

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

Compliance information

1.11 CODEMARK CERTIFICATE

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

Performance - wind

1.12 PERFORMANCE, WIND

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

Performance - fire

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIALS

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

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2 PRODUCTS

Materials

2.1 OBLIQUE™ WEATHERBOARDS

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

2.2 WALL UNDERLAY

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

2.3 HARDIE™ 20MM HORIZONTAL TIMBER CAVITY BATTENS

Radiata pine castellated cavity battens minimum 45mm wide x 20mm thick with bevelled edge H3.1 treated to NZS 3602. Refer to SELECTIONS.

2.4 20MM VENT STRIP/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.5 HARDIE™ 14MM ALUMINIUM JAMB FLASHING

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

2.6 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

Aluminium flashing extrusion used behind cladding joints.

2.7 TRIMLINE JOINTERS

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

2.8 WEATHERBOARD INTERNAL "W" CORNER

Anodised aluminium extrusion to flash behind cladding at internal corners.

2.9 HARDIE™ AXENT™ TRIM

19mm thick pre-primed fibre cement trim.

2.10 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, 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

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

2.11 CAVITY BATTEN NAILS

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

2.12 HOT DIPPED GALVANIZED NAILS

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

2.13 FLEXIBLE SEALANT

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

2.14 PRIMER

Refer to SELECTIONS.

2.15 EXTERIOR GRADE FILLER

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

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3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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

Application - particular installations

3.4 FIRE RESISTANCE RATING

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

Application - generally

3.5 INSTALL CAVITY BATTENS - OBLIQUE™ VERTICAL WEATHERBOARDS

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

3.6 PENETRATIONS AND FLASHINGS

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

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

3.7 INSTALL OBLIQUE™ WEATHERBOARDS - VERTICAL INSTALLATION

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

Completion & Commissioning

3.8 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 JAMES HARDIE® OBLIQUE™ WEATHERBOARDS

Location:	Refer drawings
Type/Brand:	Oblique™ Weatherboards
Thickness:	14mm
Width:	300mm
Length:	3000mm or 4200mm
Construction:	Cavity fix
Fixing:	Per manufacturers installation requirements.

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

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

4.3 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

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

4.4 HARDIE™ 14MM ALUMINIUM INTERNAL CORNER

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

4.5 HARDIE™ WEATHERBOARD INTERNAL 'W' CORNER

Location:	Refer drawings
Type/Brand:	Hardie™ Weatherboard Internal Corner
Finish:	Etched primed aluminium extrusion

4.6 HARDIE™ AXENT™ TRIM

Location:	Refer drawings
Type/Brand:	Hardie™ Axent™ Trim
Thickness:	19mm
Width:	70mm or 89mm.
Fixing:	Refer to items under 2.0 PRODUCTS

4.7 PRIMER

Type:	Dulux 1 Step, Acraprime 501/1, Resene Quick Dry or similar product. Select to ensure primer is compatible with paint system.

Finishing

4.8 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® 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 VILLABOARD™ SOFFIT LINING

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

Components

2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZBC E2/AS1, Table 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 - Villaboard™ Soffit Lining

2.3 CONTROL JOINT

Refer to SELECTIONS.

2.4 HARDIE™ DRIVE SCREW

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

2.5 VILLADRIVE SCREW

Villadrive Screw, 30mm x 6g, Class 3

2.6 FIBREZIP® SCREW

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

2.7 HARDIE™ FLEX NAILS

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

2.8 SEALER

Multiplast resin by Plaster systems

2.9 BASE COMPOUND

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

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2.10 JOINT REINFORCING TAPE
52mm wide perforated paper tape.

2.11 BEDDING COMPOUND
Hardie™ Base Coat compound powder.

2.12 FINISHING COMPOUND
Hardie™ Top Coat topping compound premixed.

Components - General

2.13 FLEXIBLE JOINT SEALANT
Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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

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

3.4 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

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

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

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

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

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

3.10 INSTALL VILLABOARD™ SOFFIT LINING
Install in accordance with James Hardie® installation manual requirements. Refer to SELECTIONS for fixing and jointing methods.

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

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3.12 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.13 FASTENER - SIZE AND LAYOUT

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

3.14 SEALANTS

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

3.15 FINISHING OVER DRIVEN FASTENERS

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

3.16 VILLABOARD™ JOINT FINISHING - LEVEL 3 FINISH

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

3.17 VILLABOARD™ JOINT FINISHING - LEVEL 4 FINISH

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

3.18 VILLABOARD™ JOINT FINISHING - LEVEL 5 FINISH

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

3.19 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 JH VILLABOARD™ SOFFIT LINING

Location:	Refer drawings
Brand/type:	James Hardie® Villaboard™ Soffit Lining
Thickness/Edge:	6mm thick sheet with 2 recessed edges to length - 1.2m x 2.4m, 1.2m x 3.0m sheets 9mm thick sheet with 2 recessed edges to length - 1.2m x 2.4m, 1.2m x 2.7m, 1.2m x 3.0 m sheets
Joint:	Flush joint (base compound and topping compound)
Fixing method:	Screw and adhesive - superior finish by minimising screw fixings.
Fixing Type:	Hardie™ Drive Screw, 316 stainless steel, 30mm x 7g
Adhesive:	Sikaflex-11FC by Sika or Seal N Flex-1 by Bostik
Level of Finish:	Level 4 - for smooth textured finishes and satin/flat/low sheen paints in non-critical lighting conditions.
Control joint type:	Hardie™ uPVC control joint for use in flush stopped applications.

Painting

4.2 PAINTING

Refer to painting section/s for details.

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4311SR STRATCO PROFILED METAL ROOFING

1 GENERAL

This section relates to the supply and installation of Stratco (NZ) Ltd profiled metal roofing.

It includes:

- Corrugated profile metal roofing
- Trapezoidal profile metal roofing
- Tray profile metal roofing
- Components and accessories to complete the installation

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL & DPC for roofing underlays
Refer to 7411 RAINWATER SPOUTING SYSTEMS for rainwater disposal

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
EPDM	Ethylene propylene diene monomer
NZMRM	New Zealand Metal Roofing Manufacturers Association

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 G12/AS1	Water Supplies
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397:2011	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheets, coiled sheet and plate
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
NZS 3604	Timber-framed buildings

NZMRM 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:
Selection, Use and Maintenance of Stratco Steel Products
Stratco technical details
Stratco BPIR documentation

Manufacturer/supplier contact details

Company:	Stratco (NZ) Ltd
Web:	www.stratco.co.nz
Email:	info@stratco.co.nz
Telephone:	0800 787 282

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Refer Colorsteel for warranties.

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- 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 workmanship

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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 maintenance information contained in the Stratco Steel Products document as electronic PDF format.

Provide this information prior to practical completion.

Performance

1.10 DRINKING WATER

Roofing for collecting potable water to NZBC G12/AS1.

Performance - Wind

1.11 PERFORMANCE - WIND, NON-SPECIFIC DESIGN

The design wind pressures are to NZS 3604, table 5.4. Refer to general section 1220 PROJECT for details.

Quality control and assurance

1.12 INSPECTIONS

As required by BCA.

2 PRODUCTS

Materials

2.1 TRAPEZOIDAL METAL PROFILE ROOFING - SUPERDEK

Stratco Superdek trapezoidal tray profile with 28mm rib height, 4 ribs per sheet, available in 0.4mm and 0.55mm BMT grade G550 sheet steel coated to AS 1397 and 0.9mm BMT 5000 series sheet aluminium to AS/NZS 1734 with COLORSTEEL and ColorCote finishes to AS/NZS 2728. Refer to SELECTIONS.

2.2 METAL TRAY PROFILE ROOFING - HILAND TRAY

Stratco Hiland Tray, 460mm wide tray profile with 44mm rib height, available with or without swages to tray. Available in 0.55mm BMT grade G300 sheet steel coated to AS 1397 and 0.9mm BMT 5000 series sheet aluminium to AS/NZS 1734 with COLORSTEEL and ColorCote finishes to AS/NZS 2728. Refer to SELECTIONS.

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Components

2.3 UNDERLAY

Refer to 4161 UNDERLAYS, FOIL & DPC.

2.4 FIXINGS

Fixing type, size and material being appropriate for its location and purpose. Refer to SELECTIONS.

2.5 FIXING CLIPS

Stainless steel and galvanized steel concealed fixing clips. Refer to SELECTIONS.

2.6 FLASHINGS

To NZBC E2/AS1. 0.55mm BMT minimum, grade G300 sheet flashings coated to AS 1397, 0.9mm BMT minimum, 5000 series sheet aluminium flashings to AS/NZS 1734, with soft edge where required. Refer to SELECTIONS.

Accessories

2.7 PURLIN TAPE

Proprietary self-adhesive closed cell foam tape. Refer to SELECTIONS.

2.8 CLOSURE STRIPS

Proprietary non-bituminous compressible, profiled foam strips to match sheet profile. Refer to SELECTIONS.

2.9 SEALANT

Neutral cure silicone sealant. Refer to SELECTIONS.

2.10 BOOT FLASHINGS

Proprietary EPDM flexible boot flashings to NZBC E2/AS1. 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.

Timber framing moisture content generally: 18% maximum

Installation - Generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with installation instructions contained in the Stratco BPIR documentation and NZMRM CoP.

3.6 CUTTING SHEETS

Mark sheets using marker pen or crayon and cut using nibblers or hand shears.

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Installation

3.7 APPLY PURLIN TAPE

Apply purlin tape to top face of purlins in accordance with manufacturer's instructions.

3.8 INSTALL UNDERLAY

Refer to 4161 UNDERLAYS, FOIL & DPC.

3.9 INSTALL PROFILED ROOFING

Setout sheets without distortion, plumb, true to line and face in continuous runs without end laps. Fit and fix under-flashings and fit compressible foam seals where detailed. Position sheets and screw fix through profile ribs into framing in accordance with Stratco span tables, installation instructions and NZMRM CoP, with side laps fitted snugly and evenly. Turn up sheets at roof crest/ridge to form stop end and turn down into gutters using a turn-up/turn-down tool.

3.10 INSTALL HILAND TRAY TO PURLINS

Setout Hiland Tray sheets without distortion, plumb, true to line and face in continuous runs without end laps. Fit and fix under-flashings as detailed. Lay sheets into the prevailing wind and fix to purlins with concealed clips at every sheet overlap and at sheet edges in accordance with Stratco installation instructions and NZMRM CoP, with side laps fitted snugly and evenly. Turn up sheets at roof crest/ridge to form stop end and turn down into gutters using a turn-up/turn-down tool.

3.11 INSTALL FLASHINGS

Fix ridge, apron, gutter, and barge flashings, seal as detailed and in accordance with NZBC E2/AS1.

3.12 FLASHING PENETRATIONS

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

Completion & Commissioning

3.13 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 TRAPEZOIDAL PROFILE ROOFING

Location:	Roof - refer drawings
Supplier:	Stratco (NZ) Ltd
Profile:	Stratco Superdek or similar approved trapezoidal profile
Gauge:	0.55mm BMT
Coating system:	Colorsteel MAXAM
Colour:	Refer architectural drawings
Fixings:	Class 4 Type 17 12-11x65 roofing screw with neoprene washer

Base metal:	Effective cover:	Base metal coating:	Finish:	Suitable for Exposure Zones to NZS 3604:
0.4mm BMT Grade G550 steel	760mm	zinc/aluminium	Unpainted	-
0.55mm BMT Grade G550 steel	750mm		COLORSTEEL Endura	B, C
			COLORSTEEL Maxx	B, C, D
			ColorCote Zinacore	B, C

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		zinc/aluminium /magnesium	ColorCote Magnaflow	B, C, D
0.9mm BMT 5000 series aluminium	750mm	n/a	COLORSTEEL Altimate	B, C, D, E
		n/a	ColorCote Alumigard	B, C, D, E

Framing type:	Base metal:	Fixings:
Timber	Steel	Class 4 Type 17 12-11x65 roofing screw with neoprene washer
	Aluminium	Alutite Type A 14x73 roofing screw with EPDM and profile washer
Steel	Steel	Class 4 12-14x55 Tek roofing screw with neoprene washer
	Aluminium	SS304 Steel Tek 14x70 roofing screw with EPDM and profile washer

Colour: Refer to Stratco for available colour ranges

Components

4.2 FLASHING

Refer flashings section.

Accessories

4.3 CLOSURE STRIPS

Refer drawings

4.4 SEALANT

Type/brand: Per builder as compatible with roofing.

4.5 EPDM BOOT FLASHING

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4383 EXTERIOR TIMBER DECKING, BALCONY AND STEPS

1 GENERAL

This section relates to the fabrication and installation of exterior timber
- spaced boarding to decks
- steps and landings

Related work

1.1 RELATED SECTIONS

Refer to the drawings

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

1.4 SUSTAINABLE TIMBER

This project uses FSC Certified sustainable timber.

Abbreviations and definitions:
FSC
- Forest Stewardship Council

FSC Forest Management (FM) Certification
- A forest management unit independently FSC inspected and certified that it complies with the internationally-agreed FSC Principles.

FSC Chain of Custody (COC) Certification
- COC certification applies to those who process, transform or trade forest products, providing a guarantee about the production and source of FSC-certified products and tracking the production and distribution of the products.

Organisation website details
FSC website:- https://nz.fsc.org/en-nz
FSC suppliers lists:- https://info.fsc.org/certificate.php#result

2 PRODUCTS

Materials

2.1 CERTIFIED SUSTAINABLE TIMBER

Refer to SELECTIONS for details of amount, type, suppliers.

Certified Sustainable FSC-COC Certified (or similar pre-approved) timber from forest to installation. Contractor to obtain and track all timber FSC-COC certificates and receipts showing FSC-COC numbers, including signed FSC outsourcing agreements between parties (ie FSC timber broker and non-FSC door joiner).

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FSC suppliers lists:- https://info.fsc.org/certificate.php#result

2.2 SOLID TIMBER COMPONENTS

Selection to NZS 3602.

2.3 SOFTWOOD SPACED BOARDING FOR EXTERIOR DECKS

Selected radiata pine, H3.2 to NZS 3602, table 2A. 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.

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.

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4 SELECTIONS

Standard Decking on Ground

4.1 H3.2 TIMBER - DECKING

Location:	Refer to the drawings and documentation
Species/grade:	Radiata Pine
FSC:	FSC certification Required
Treatment:	H3.2 CCA (preservative code 01 or 02)
Size:	90 x 45
Moisture content:	To Meet NZS3604 requirements
Slip resistance:	Min 0.45-0.60 for travel perpendicular to grooved face to comply with NZBC D1
Finish:	Grip side up (Grooved Face) where a deck is part of the main access route into a building- refer above for Slip resistance.
Gap Spacing:	4mm Min between boards
Joist Spacing:	Max spacing of 600mm between joists.
Fixing:	Stainless steel decking screw 75 x 10g, self -drilling self-countersinking deck screws with torx drive head to achieve minimum 30mm penetration into the joists. Fixings must be positioned approximately 20mm from boards edges, with two fixings applied per joist. Fixings at board ends must be pre-drilled minimum 12mm from end. Apply bevel to tops and allow approx. 2mm gap at butt joins to allow airflow
Note:	A 12 mm minimum gap between the building cladding and decking for drainage and maintenance is required

4.2 H3.2 TIMBER - STEPS

Location:	Refer to the drawings and documentation
FSC:	FSC certification Required
Treatment:	H3.2 CCA (preservative code 01 or 02)
Size:	90 x 45
Slip resistance:	Min 0.45-0.60 for travel perpendicular to grooved face to comply with NZBC D1
Finish:	Grip side up (Grooved Face) where a deck is part of the main access route into a building- refer above for Slip resistance:
Fixing:	Stainless steel decking screw 75 x 10g, self -drilling self-countersinking deck screws with torx drive head to achieve minimum 30mm penetration into the joists. Fixings must be positioned approximately 20mm from boards edges.
Width:	Minimum clear-width of 1.2m for accessibility, refer to the drawings and documentation
Handrail	H3.2 accessible graspable hand-rail to comply with NZBC D1 Clause 6.0 and figure 26 Handrail Profiles and Clearances. Suitably fix with HD Galv. coach bolts or recessed M12 bolts in accordance with NZS 3604. Suitably cut any exposed thread to stop snagging
Handrail Posts	100x100 H4 dressed posts with suitable foundations to NZS3604and at 1200mm ctrs Max or to suit layout. The tops should be sloped to suit handrail set out and for water shedding
General:	Refer to the Engineers documentation for structural timber sizes and set out requirements

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Balcony Decking on Deck Jacks

4.3 H3.2 TIMBER - BALCONY DECKING

Location:	Refer to the drawings and documentation
Species/grade:	Radiata Pine
FSC:	FSC certification Required
Treatment:	H3.2 CCA (preservative code 01 or 02)
Size:	90 x 45
Moisture content:	To Meet NZS3604 requirements
Slip resistance:	Min 0.45-0.60 for travel perpendicular to grooved face to comply with NZBC D1
Finish:	Grip side up (Grooved Face)
Gap Spacing:	4mm Min between boards
Joist Spacing:	Max spacing of 600mm between joists
Fixing:	2 x Stainless steel decking screw 75 x 10g, (allow for pilot holes and countersinking) countersinking deck screws with torx drive head to achieve minimum 30mm penetration into the joists. Fixings must be positioned approximately 20mm from boards edges, with two fixings applied per joist. Fixings at board ends must be pre-drilled minimum 12mm from end. Apply bevel to tops and allow approx. 2mm gap at butt joins to allow airflow .
Note:	A 12 mm minimum gap between the building cladding and decking for drainage and maintenance is required

4.4 H3.2 TIMBER - BALCONY DECK ACCESS

Location:	Refer to the drawings and documentation, to allow access to any outlet and or overflow for cleaning
Species/grade:	Radiata Pine
FSC:	FSC certification Required
Treatment:	H3.2 CCA (preservative code 01 or 02)
Size:	90 x 45 or 140 x 32. Refer landscape plans
Type:	Allow for a suitably sized section of removable decking (Screwed and cut to suit between decking joists) to allow access to the overflow drain for cleaning
Moisture content:	To Meet NZS3604 requirements
Finish:	Grip side up (Grooved Face) where a deck is part of the main access route into a building- refer above for Slip resistance.
Gap Spacing:	4mm Min between boards
Fixing:	Stainless steel decking screw 75 x 10g, self -drilling self-countersinking deck screws with torx drive head to achieve minimum 30mm penetration into the joists. Fixings must be positioned approximately 20mm from boards edges, with two fixings applied per joist. Fixings at board ends must be pre-drilled minimum 12mm from end. Apply bevel to tops and allow approx. 2mm gap at butt joins to allow airflow
Note:	A 12 mm minimum gap between the building cladding and decking for drainage and maintenance is required

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4.5 H3.2 ENTRY ACCESS ROUTE FLOATING DECK

Location:	Refer to the drawings and documentation
Species/grade:	Radiata Pine
FSC:	FSC certification Required
Treatment:	H3.2 CCA (preservative code 01 or 02)
Size:	140 x 32 Griptreads up. Refer landscape plans
Type:	Decking over Nurajacks over concrete.
Moisture content:	To Meet NZS3604 requirements
Finish:	Grip side up (Grooved Face) where a deck is part of the main access route into a building- refer above for Slip resistance.
Spacing:	4mm Min between boards - Joists @ 90 x 45 SG8 H3.2 @400crs as per NZS3604. Nurajacks spaced at 700crs.
Fixing:	Stainless steel decking screw 75 x 10g, self -drilling self-countersinking deck screws with torx drive head to achieve minimum 30mm penetration into the joists. Fixings must be positioned approximately 20mm from boards edges, with two fixings applied per joist. Fixings at board ends must be pre-drilled minimum 12mm from end. Apply bevel to tops and allow approx. 2mm gap at butt joins to allow airflow
Note:	A 12 mm minimum gap between the building cladding and decking for drainage and maintenance is required

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4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to the fabrication, supply, and installation of APL Window Solutions residential window and door systems.

1.1 RELATED WORK

Refer to appropriate AGP glazing sections for glass types.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

WGANZ	Window & Glass Association NZ
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 G4/AS1	Ventilation of buildings
NZBC H1/AS1	Energy efficiency for all housing and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 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
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

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1

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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)

CodeMark™ CMNZ10033 ver2	APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors.

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

APL Window Solutions	Specifier Guide
APL Window Solutions	Metro Series ThermalHEART® with Centrafix™ System Guide (Version 08/23a)
APL Window Solutions	Windows and Doors for Residential Purposes BPIR
APL Window Solutions	Windows and Doors for Residential Purposes - Thermally Insulated BPIR
APL Window Solutions	Entrance Door Overview
APL Window Solutions	Testing of APL new window and installation to EM9 test method

BRANZ Appraisal 1188 (2023) - APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors - Amended 2 May 2024
BRANZ Appraisal 1259 (2024) - APL ThermalHEART+® Window and Door Systems - Amended 2 May 2024

Manufacturer/supplier contact details

Company:	Architectural Profiles Ltd.
Trading as:	APL Window Solutions
Web:	www.altherm.co.nz www.firstwindows.co.nz www.vantage.co.nz www.aplnz.co.nz
Email:	apl.techinfo@aplnz.co.nz altherm.techinfo@aplnz.co.nz firstwindows.techinfo@aplnz.co.nz vantage.techinfo@aplnz.co.nz
Telephone::	07 849 8888

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For materials including hardware and componentry
12 years:	For AGP glass
15years:	For Duratec powdercoat finish durability and colour

- 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.

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1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years: For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

1.9 DESIGN PARAMETERS - WIND

Design the installation to the manufacturer requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
APL Window Solutions Specifier Guide

Provide this information prior to practical completion.

1.11 MARKING - EXTERNAL WINDOWS / DOORS

Each window claimed by the manufacturer to be complaint with NZS 4211 to be labelled on the frame to NZS 4211.

Compliance Information

1.12 COMPLIANCE - CODEMARK CERTIFICATE

APL Metro Series ThermalHEART® with Centrafix™ windows and doors meets the requirements of the NZBC when used within the Conditions and Limitations of its CodeMark Certificate of Conformity CMNZ10033.

Performance

1.13 EXTERNAL WINDOW PERFORMANCE

APL Window Solutions windows and doors have been tested to NZS 4211 and the requirements of BPS, 4.4.1 Structural and weathertightness provisions.

1.14 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

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2 PRODUCTS

2.1 WINDOWS

Refer to SELECTIONS.

2.2 DOORS

Refer to SELECTIONS.

Materials

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)

2.6 GLASS

Refer to the glazing section for glass types and installation.

Reveals

2.7 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

Flashings

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 Windows and doors. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components for installation - direct fix systems

2.9 SILL PAN FLASHING

To NZBC E2/AS1, paragraphs 9.1.10.3 - 9.1.10.6. Flashing for direct fix claddings to collect and drain water that may penetrate through the window or door unit. Size to extend from the inner most point of the aluminium frame out over the external face of the cladding.

2.10 SUPPORT ANGLE

WGANZ aluminium support angle for use below the sill pan for deeper claddings to transfer the weight of the window back to the frame. Size to suit cladding thickness.

Components for installation - cavity systems

2.11 CENTRAFIX SILL SUPPORT BAR

Extruded aluminium sill support bar to suit Centrafix window profile and provide continuous support to the window / door unit.

Components

2.12 GLAZING GASKETS

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



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2.13 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.

2.14 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, Opening windows.

2.15 FIXING BRACKETS

Designed by manufacturer to specific design.

2.16 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.

Finishes

2.17 DURATEC POWDER COATED ALUMINIUM

High-performance polyester powder coating in accordance with WGANZ PQAS and AAMA 2604. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with manufacturer's shop drawings and installation instructions.

Fabrication

3.6 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.

3.7 TIMBER REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces. Securely fix reveals through aluminium fin.

3.8 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

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3.9 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.

3.10 PASSIVE VENTILATION

Factory fit all required and scheduled passive ventilation systems to NZBC G4/AS1, paragraph 2.2.2.5, NZS 4303 and manufacturer's requirements.

Installation - windows and doors

3.11 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed.

3.12 EXPOSED FIXINGS AND FASTENINGS

Fixings and fastenings exposed to the weather to be aluminium, or Type 304 stainless steel.

3.13 PROTECTED FIXINGS AND FASTENINGS

Fixings and fastenings not exposed to the weather may be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

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 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.

3.16 INSTALLATION METRO SERIES THERMALHEART WITH CENTRAFIX

Install in accordance with Centrafix™ System Guide with glazing and thermal insulators aligned with the wall insulation. Face fix through protruding aluminium fins overlapping the outside face of the framing through building underlays.

3.17 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 plus any jamb scriber width at each end.

3.18 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 Air seals. Form an air-tight seal by means of proprietary expanding foam or sealants used with PEF 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.

3.19 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.20 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window and sealant manufacturer and to make the installation weathertight.. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.



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3.21 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.

3.22 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.

3.23 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.

3.24 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM

In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted to minor surface scratching. Otherwise replace all damaged material.

3.25 SAFETY

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

Completion & Commissioning

3.26 COMPLETION MATTERS

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

4 SELECTIONS

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

Performance

4.1 THERMAL PERFORMANCE - WINDOWS & DOORS

As per H1 report.

Finishes - Powder Coating

4.2 DURATEC - POWDER COATING FINISH

Type:	Polyester organic powder coating
System integrity:	Minimum 25 years film integrity, up to 20 years colour integrity
Colour:	Refer architectural drawings
Finish:	Refer architectural drawings

Glazing

4.3 GLASS

Type/thickness:	Refer to 4610AG AGP GLAZING RESIDENTIAL for type and thickness.

Window and door system - Residential Series THERMALHEART+®

4.4 APL RESIDENTIAL THERMALHEART+ FIXED WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved
Window No.:	Refer window schedule

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4.5 APL RESIDENTIAL THERMALHEART+ AWNING WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved
Window No.:	Refer window schedule
Fastener range:	Urbo Helix
Fastener tongue:	Single or double.

4.6 APL RESIDENTIAL THERMALHEART+ SLIDING DOOR

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved
Rail type:	Contractor to confirm
Door No.:	Refer window schedule

APL Entrance doors

4.7 APL ENTRANCE DOOR - HINGED DOOR WITH SIDELIGHT

Type:	To be confirmed
Door No.:	Refer window schedule
Range:	To be confirmed
Configuration:	Refer window schedule
Glazing:	Double glazing
Hinge:	Refer to APL En 4 hinges minimum with a minimum two fitted at the top
Hardware:	Cylinder mortice lock with 60mm backset (93mm wide stile) Finger turn on inside (egress doors)

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4555 GARAGE DOORS

1 GENERAL

This section relates to the manufacture, supply and installation of garage door systems including required opening/operating systems.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170	Structural design actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3604	Timber-framed buildings
AS/NZS 4505	Garage doors and other large access doors

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

Requirements

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

Performance

1.3 DESIGN PARAMETERS WIND

Design the installation to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.4 LOADS - NON - SPECIFIC DESIGN - DOORS UP TO 3.0M HIGH

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind performance requirements to NZS 3604.

1.5 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

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2 PRODUCTS

2.1 GARAGE DOOR

Manufacture to AS/NZS 4505 complete with a compliance label.

2.2 MOTORISED DOOR OPENER

3 EXECUTION

3.1 PREPARATION FOR INSTALLATION

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

3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weathertight fit round the entire perimeter.

3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

Completion

3.6 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

3.7 REPLACE

Replace damaged, cracked or marked elements.

3.8 LEAVE

Leave work to the standard required by following procedures.

3.9 REMOVE

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

4 SELECTIONS

4.1 GARAGE DOOR - SECTIONAL INSULATED OVERHEAD DOOR

Location:	Refer drawings
Brand:	Dominator or approved alternative
Type:	Sectional

4.2 GARAGE DOOR CONTROLLERS

Provide remotes as required.

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4610AG AGP® GLAZING RESIDENTIAL

1 GENERAL

This section relates to the supply and fixing of **AGP®** glass products for use with APL Window Solutions external and internal joinery in residential type buildings and includes:

- Window and door glazing

This **AGP** section is to be read in conjunction with **APL Window Solutions** branded sections

1.1 RELATED 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:

IGU	Insulating Glass Units
PVB	Polyvinyl Butyral
uPVC	Unplasticised polyvinyl chloride

Documents

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC B2/AS1	Durability provisions for building elements
NZBC F2/AS1	Hazardous building materials
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM1	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4667	Quality requirements for cut and processed glass
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
BPS	Building Product Specifications

1.4 MANUFACTURER'S DOCUMENTS

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

- Product notes and manufacturing limitations
- Care and maintenance of your AGP glass
- Condensation guide
- AGP Glass handling, storage & transportation guide
- Guide to visual quality of residential glass and insulating glass units (IGUs)
- Insulating glass unit (IGU) warranty

Manufacturer/supplier contact details

Company:	AGP
Web:	www.agpl.co.nz
Email:	technical@agpl.co.nz
Telephone:	07 849 8880

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

12 years:	For insulating glass units (IGUs)
12 years:	For float glass
12 years:	For toughened glass
12 years:	For laminated glass

- 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 supply.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

- Care and maintenance of your AGP glass
- Condensation guide

Provide this information prior to practical completion.

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Performance

1.10 THERMAL STRESS ANALYSIS

For non-heat treated glass obtain a thermal stress analysis for tinted, reflective and other solar control vision glass including IGU's for review before placing final order.

1.11 THERMAL PERFORMANCE - EXTERNAL GLAZING

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

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

Performance – Wind (design by contractor)

1.12 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer requirements and as appropriate for the project wind design parameters. Refer to SELECTIONS.



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Quality control and assurance

1.13 INSPECTIONS

As required by BCA.

2 PRODUCTS

Materials, windows and doors

2.1 CLEAR FLOAT GLASS

Clear ordinary transparent float glass for general window/door glazing application. Thickness to NZS 4223.1, NZS 4223.Supp1, NZS 4223.3 and NZS 4223.4.

2.2 OBSCURE GLASS

Translucent rolled glass, sand-blasted or acid etched on one surface for a decorative finish.

2.3 LAMINATED GLASS

Grade A safety glass to AS/NZS 2208 with PVB interlayer.

2.4 TOUGHENED GLASS

Grade A safety glass to NZBC F2/AS1 and AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E for critical areas.
Refer to SELECTIONS.

2.5 TINTED FLOAT GLASS

Body tinted float glass. Thickness to NZS 4223.1 and NZS 4223.Supp 1, NZS 4223.3 and NZS 4223.4.

2.6 REFLECTIVE AND COATED FLOAT GLASS

Coated float glass incorporating both solar and thermal insulation properties, or coated float glass with thermal insulation properties only.

2.7 INSULATING GLASS UNITS (IGU'S)

To the performance requirements of NZS 4223.2.
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

Components, aluminium and uPVC glazing

2.8 GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

2.9 SETTING BLOCKS

APL Window and Door Systems setting blocks consisting of PE, PP or PA material selected to suit the frame and panel type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.2, NZS 4223.3 as modified by BPS paragraph 4.4.1.4, and NZS 4223.4.
Interface between external glazing and other elements to be wind and watertight on completion.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products, and to the AGP Glass handling, storage & transportation guide.

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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.

3.5 GLASS CONDITION

All glass to have undamaged edges and surfaces in accordance with AS/NZS 4667.

3.6 GLASS THICKNESS

Whether stated in a glazing schedule or not, confirm glass thicknesses to NZS 4223.1, NZS 4223.3, NZS 4223.4. 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.

3.7 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to NZS 4223.1, Section 4 Glazing.

Conditions - human impact safety requirements

3.8 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 as modified by BPS paragraph 4.4.1.4, for thickness and maximum areas of safety glass.

3.9 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.

3.10 CONTAINMENT

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

Assembly

3.11 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.12 EDGE WORK

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

Installation/application

3.13 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.
Refer to AS/NZS 4667 and NZS 4223.1 for glass and glazing.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

3.15 INSTALLING INSULATING GLASS UNITS

Refer to the APL branded window manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to the manufacturers requirements. Fit setting and location blocks and bead glaze units using a compatible sealant.

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3.16 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar control glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

Application aluminium

3.17 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS 4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Application uPVC

3.18 INSTALL GLASS TO uPVC FRAMES

Install glass to NZS 4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Finishing

3.19 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

3.20 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

Completion & Commissioning

3.21 COMPLETION MATTERS

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

3.22 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS

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

Performance - wind

4.1 WIND ZONE - NON-SPECIFIC DESIGN

Refer to general section 1220 PROJECT for design wind pressures.

Glass by type

4.2 AGP CLEAR GLASS

Location:	All glazing
Brand:	AGP
Thickness:	4mm UNO

4.3 AGP OBSCURE GLASS

Location:	Bathrooms
Brand:	AGP
Pattern:	To be confirmed
Thickness:	4mm

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4.4 AGP TOUGHENED GLASS

Location:	Where required for safety glass
Brand:	AGP
Type:	Toughened, Toughened and Heat Soaked
Thickness:	4mm

4.5 AGP SOLUX-E® - LOW E THERMAL AND SOLAR CONTROL IGU

Location:	All IGUs
Brand/type:	AGP SOLUX-E®
Outer glass type:	Clear
Coated surface:	#2
Outer glass thickness:	4mm
Spacer width:	12mm
Spacer type:	ATS-Architectural Thermal Spacer®
Space gas:	Argon
Inner glass type:	Clear
Inner glass thickness:	4mm
Note:	**Glass and spacing thickness to be confirmed by joinery manufacturer to comply with min. R0.48 requirements.**



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4711EW EARTHWOOL® GLASSWOOL THERMAL INSULATION

1 GENERAL

This section relates to the supply and installation of Earthwool® glasswool thermal insulation. It includes:

- ceiling insulation
- wall insulation
- underfloor insulation

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlay and roofing underlay.

1.2 ABBREVIATIONS AND DEFINITIONS

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

Documents

1.3 DOCUMENTS

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

NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
AS/NZS 3000	Electrical installations (Australian/New Zealand Wiring Rules)
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
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
CodeMark™ CMNZ30095 verC	Knauf Insulation

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Earthwool® glasswool Insulation Technical Data Sheets
Earthwool® glasswool Insulation Material Safety Data Sheets
Earthwool® glasswool Insulation Installation Instructions
BRANZ Appraisal 648 (2022) - Knauf glasswool Insulation
Eurofins Gold Certificate for Indoor Air Comfort: IACG-323-01-25-2022
Certifire Certificate: AC100.2
ISO 9001 Certificate Registration No. 44 100 190742

Manufacturer/supplier contact details

Company:	Knauf Insulation Limited
Web:	www.knauf.com/en-NZ/knauf-insulation
Email (Technical):	tech.nz@knaufinsulation.com
Email (Sales):	sales.nz@knaufinsulation.com
Telephone:	0800 KNAUFi (562 834)

Warranties

1.5 WARRANTY

Provide a warranty for:

50 years	For unfaced Earthwool® glasswool insulation materials
15 years	For Earthwool® glasswool insulation underfloor

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

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- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

years For installation workmanship

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to experience, skill, and qualifications.

1.8 NO SUBSTITUTIONS

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

Performance - fire properties

1.9 FIRE PROPERTIES

Earthwool® glasswool insulation is deemed non-combustible in accordance with AS 1530.1 and non-combustible to test criteria under the 30's Needle Flame Test to AS/NZS 60695.11.5.

Compliance

1.10 CODEMARK CERTIFICATE

Earthwool® glasswool insulation meets the requirements of the NZBC when used in accordance with the conditions and limitations of its Certificate of Conformity CMNZ30095.

2 PRODUCTS

2.1 WALL INSULATION SEGMENTS

Earthwool® glasswool insulation: Wall, non-combustible and certified Red List Free glasswool insulation segments to AS/NZS 4859.1, manufactured using up to 80% recycled glass with DriTherm® silicone treatment, ECOSE® Technology plant-based binder and TwinTech® smooth finish on both faces. Available in a range of segment sizes, thicknesses and R-values. Refer to SELECTIONS.

2.2 CEILING & SKILLION ROOF INSULATION SEGMENTS

Earthwool® glasswool insulation: Ceiling, non-combustible and certified Red List Free glasswool insulation segments to AS/NZS 4859.1, manufactured using up to 80% recycled glass with DriTherm® silicone treatment, ECOSE® Technology plant-based binder and TwinTech® smooth finish on both faces. Available in ceiling and skillion roof variations in a range of segment sizes, thicknesses and R-values. Refer to SELECTIONS.

2.3 MULTI-USE INSULATION ROLLS

Knauf Insulation: Multi-use Roll, non-combustible and certified Red List Free glasswool insulation rolls to AS/NZS 4859.1, manufactured using up to 80% recycled glass with DriTherm® silicone treatment, ECOSE® Technology plant-based binder and TwinTech® smooth finish on both faces. Available in rolls 90mm thick x 430mm and 580mm wide x 8.5m long with R-value of 2.6.

Accessories

2.4 PLASTIC STRAPPING TAPE

Proprietary plastic strapping tape.

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2.5 WIRE NETTING

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Do not use damaged or wet insulation material.

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 - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

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

3.6 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 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.

3.9 CUTTING INSULATION

Cut insulation using a sharp craft knife.

Installation - Wall Framing

3.10 FIT WALL INSULATION - TIMBER WALL FRAMING

Measure distance between studs and cut Earthwool® glasswool insulation segments/rolls minimum 10mm wider and friction fit between framing members with front face of insulation flush with framing. Leave no gaps and maintain full thickness of insulation over whole installation. If cavity depth is greater than the insulation nominal thickness, fix or strap the insulation to secure. Cut insulation pieces as required to fill small spaces, behind outlet boxes, gaps around penetrations and other obstructions. Without compressing, tuck insulation behind wiring, plumbing or ductwork.

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Installation - Ceiling

3.11 FIT INSULATION OVER CEILING FRAMING

Loose lay Earthwool® glasswool insulation rolls over the ceiling framing and between truss chords, leaving no gaps and maintaining full thickness of insulation over whole installation. Cut insulation pieces as required to fill small spaces, gaps around penetrations and other obstructions. Without compressing, tuck insulation behind wiring, plumbing or ductwork.

Installation - Roof

3.12 FIT INSULATION BETWEEN SKILLION ROOF RAFTERS

Friction fit Earthwool® glasswool insulation segments between rafters, flush with the face of the rafter, leaving no gaps and maintaining a continuous clearance of 25mm minimum between the insulation and the roofing membrane (underlay). Cut insulation pieces as required to fill small spaces, gaps around penetrations and other obstructions. Without compressing, tuck insulation behind wiring, plumbing or ductwork.

Completion & Commissioning

3.13 COMPLETION MATTERS

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

Earthwool® glasswool insulation packaging is recyclable.

4 SELECTIONS

For further details on selections go to www.knauf.com/en-NZ/knauf-insulation
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 EARTHWOOL® EXT. WALL INSULATION - 140MM R4.1

Location:	Refer architectural drawings
Brand:	Earthwool® glasswool insulation
Product:	R4.1 Soundshield Plus
R-value:	R4.1
Thickness:	140mm
Size:	580mm x 1160mm
Density:	22.6kg/m³

4.2 EARTHWOOL® EXT. WALL INSULATION - 90MM R2.8

Location:	Refer architectural drawings
Brand:	Earthwool® glasswool insulation
Product:	R2.8 Soundshield Plus
R-value:	R2.8
Thickness:	90mm
Size:	580mm x 1160mm
Density:	30.7kg/m³

4.3 EARTHWOOL® INTERIOR WALL INSULATION - 90MM R2.4

Location:	Refer architectural drawings
Brand:	Earthwool® glasswool insulation
Product:	R2.4
R-value:	R2.4
Thickness:	90mm
Size:	580mm x 1160mm
Density:	14.6kg/m³

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4.4 EARTHWOOL® GLASSWOOL CEILING INSULATION - R7.0 SINGLE LAYER

Location:	Ceilings - refer drawings
Brand:	Earthwool® glasswool insulation
Application:	Over ceiling framing.
Product:	Ceiling segments
R-value:	R7.0
Thickness:	330mm
Size:	460mm x 1200mm
Density:	8kg/m³

4.5 EARTHWOOL® GLASSWOOL CEILING INSULATION - R3.6 WITHIN 500MM OF EAVE

Location:	Ceilings - refer drawings
Brand:	Earthwool® glasswool insulation
Application:	Over ceiling framing.
Product:	Ceiling segments
R-value:	R3.6
Thickness:	175mm
Size:	460mm x 1200mm
Density:	7.4kg/m³

4.6 EARTHWOOL® GLASSWOOL THERMAL SKILLION ROOF INSULATION

Location:	Refer drawings
Brand:	Earthwool® glasswool insulation
Product:	Ceiling, skillion roof segments
R-value:	R7.0 330mm blanket

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4811 SEALANT

1 GENERAL

This section relates to the selection of sealants and application methods for sealants nominated in other work sections.

1.1 RELATED WORK

Refer to the drawings

1.2 ABBREVIATIONS

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

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 E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1530.4:2005	Methods for fire tests on building materials, components & structures. Part 4: Fire resistance test of elements of construction
AS/NZS 4020	Testing of products for use in contact with drinking water
ASTM C719	Standard test method for adhesion and cohesion of elastomeric joint sealants under cyclic movement
EN 1366.4	Fire resistance tests for service installations. Linear joint seals.
ISO 9047	Building construction - Jointing products - Determination of adhesion/cohesion properties of sealants at variable temperatures
ISO11600	Building construction - Jointing products - Classification and requirements for sealants

1.4 MANUFACTURER'S DOCUMENTS

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

Relevant Sika Product	Technical Data Sheets
Relevant Sika Product	Safety Data Sheets
CETEC Test Certificates	For VOC content of selected Sika sealants
CSIRO Test certificates	For fire rating of various Sika sealants
EXOVA Test certificates	For fire rating of various Sika sealants
BRANZ Appraisal 311 [2024]	Sikaflex® MS (Building Sealant)
BRANZ Appraisal 613 [2024]	Sikaflex® AT - Facade Sealant

Manufacturer/supplier contact details:

Company:	Sika (NZ) Ltd
Web:	nzl.sika.com
Email:	info@nz.sika.com
Telephone:	0800 SIKA NZ, 0800 745 269

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:



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10 years: For Sika sealants and adhesives

- Provide this warranty on the Sika standard form. (For materials only. Warranty excludes application)
- Commence the warranty from the date of practical completion of the contract works.
- **Sika** (NZ) Ltd will warrant that Sika sealant products will perform in accordance with the information stated in **Sika** (NZ) Ltd current Technical Data Sheets.
- Refer to **Sika** (NZ) Ltd for further information on warranty.

Refer to the general section 1237 WARRANTIES for additional requirements

Requirements

1.6 SEALANT SELECTION

Refer to the **Sika** (NZ) Ltd current Technical Data Sheet before commencing sealant installation. Ensure that the correct sealant has been selected for the intended application and substrates. Check that the joint design allows for movement and or substrate thermal expansion and contraction, and is within the sealants range of service.

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Sealant work, including preparation, to be carried out by competent and experienced sealant applicators.

2 PRODUCTS

Joint Substrate Primers & Accessories

2.1 NON-POROUS SUBSTRATE CLEANER - TO IMPROVE SEALANT ADHESION

Sika Aktivator-205, a transparent, alcohol based, one component cleaner with adhesion promoters for cleaning and activating non-porous substrates prior to the application of Sika sealants. For use with Sika products only.

2.2 POROUS SUBSTRATE PRIMER - TO IMPROVE SEALANT ADHESION

Sika Primer-3N, transparent solvent based, one component, reactive epoxy resin primer for use on a wide range of porous substrates. For use with Sika products only.

Facade sealants for concrete / masonry brickwork - non-fire rated

2.3 FACADE SEALANT - MEDIUM MOVEMENT, HYBRID, PAINTABLE

Sikaflex® AT-Facade, is a one component hybrid (silane terminated polymers), low VOC, moisture curing sealant with good weathering and a joint movement capacity +/-25%. Conforms to ISO 11600 Type F, Class 25LM and has a BRANZ Appraisal 613.

Can be over-painted with a range of paints and coatings.

2.4 ROOFING SEALANT - METAL ROOFING PROFILES & FLASHINGS

Sikasil® Roofing and Plumbing, a one component neutral curing silicone sealant with movement joint capacity of +/-25%. Non-corrosive to metals and has excellent adhesion to many substrates including copper and zinc. Conforms to ISO 11600 Type F, class 25LM.

2.5 BATHROOM SEALANT - ACRYLIC BATHWARE

Sikasil ® NG, a one component, neutral curing silicone sealant formulated for use with acrylic, ASB and polycarbonate bathware.

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Specialist building concrete floor sealants

Facade sealants for concrete / masonry brickwork - fire rated

2.6 FACADE SEALANT - PU, FOR FIRE RATED JOINTS, UP TO 4 HOURS

Sikaflex®-400 Fire is a one component, fire rated, polyurethane, moisture curing, paintable, elastic joint sealant with a movement capacity of +/-35%. For internal and external applications. Up to 4 hour fire resistance (depending on tested joint configuration) in accordance with AS 1530.4 and EN1366.4.

Acrylic sealants

2.7 FAST GAPS

Fast Gaps, a high performance, acrylic gap filler that cures quickly to form a permanently flexible seal with excellent primerless adhesion to most building materials. The sealant is non staining and can be painted or papered over approximately one hour after application. Suitable as an acoustic sealant. VOC content 16 grams/Litre vs. 250 grams /Litre limit for architectural sealants.

PU foams

2.8 SIKA® BOOM

Sika® Boom, a one component, high yield polyurethane based fast curing expanding foam applied with the Sika Boom-G Dispenser gun. VOC content 10 grams/Litre vs. 250 grams /Litre limit for architectural sealants.

Adhesives

2.9 BATHROOM ADHESIVE - ACRYLIC SHOWER LINERS & BATHWARE

Sika Showerbond, a one component solvent based, fast grab, gun grade adhesive, specifically formulated for bonding plastic shower linings to unpainted gypsum plasterboard or fibre cement wall linings.

2.10 INTERIOR SOLVENT BASED ADHESIVE - BONDING WALL PANELS

Sika® Nailbond® SB is a one component, solvent based, general purpose, rubber adhesive for bonding internal lining panels including wet area internal lining panels such as seratone or hardiglaze to substrates. Can use on LOSP or CCA treated timber.

3 EXECUTION

Conditions

3.1 COMPATIBILITY

Ensure compatibility by using only Sika branded sealants with Sika branded products including cleaners, primers, sealants, adhesives, filler and backing rods. Products should not be substituted without the prior approval of the specifier.

3.2 NON SLUMP SEALANTS

Use only thixotropic sealants capable of supporting their own weight (non slump) in vertical applications.

3.3 SELF LEVELLING SEALANTS

Use only self levelling sealants in contained horizontal applications.

3.4 SUBSTRATE STAINING

Note that some sealants can cause staining on porous substrates such as concrete, masonry and natural stone. If in doubt, compatibility testing should be undertaken to confirm suitability prior to application.

3.5 SEALANT PAINTABILITY

Ensure that a paintable sealant is selected when the sealant joint requires painting. The overpainting of sealant will reduce its flexibility at the coating interface. If in doubt about the sealant / over-coating compatibility, testing should be undertaken to confirm suitability prior to application.

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NOTE: This excludes silicon based sealants which are not paintable.

3.6 COLOURS

Refer to SELECTIONS for colour option/s. Where colour is not specified, choose sealant colours from the **Sika** standard/special colour ranges.

Preparatory work

3.7 CONDITIONS FOR APPLICATION

Ensure conditions for application are clean, dry and dust free as possible. Avoid dust, dirt, water and other contamination settling on the cleaned and prepared joint substrate.

Ensure adequate ventilation is maintained during the preparation and application of sealant work and all relevant health and safety equipment is utilised.

Ensure application of Sika products occurs when the ambient and substrate temperature is in accordance with the appropriate Product Data Sheet.

3.8 TEST SUBSTRATES

If in doubt about the suitability of substrate, test the affected substrate for indications of poor adhesion, staining and contamination.

If poor adhesion is evident from initial tests, consult **Sika** about the application of a suitable cleaning and preparation process and the application of a primer. Only use combinations of sealants and substrates for which favourable adhesion and compatibility have been confirmed.

3.9 SUBSTRATE CLEANING & PREPARATION

Prepare and clean joint substrates in accordance with the relevant and current Product Data Sheet. Protect adjacent surfaces from abrasion or other damage.

Typically concrete surfaces should be ground to remove concrete laitance and other surface contaminates. Non-porous surfaces such as metal to be cleaned with a Sika approved cleaner / activator to remove any contaminating films or barriers.

Apply a suitable masking tape to the adjacent surfaces along the length of joints to prevent contamination during application. Mask off any surfaces which would be difficult to clean if smeared with sealant, or where excess sealant could not be neatly trimmed off or removed.

3.10 CLEAN METAL SURFACES

Clean metal surfaces with approved **Sika** (NZ) Ltd cleaners to remove any grease deposits.

3.11 GRIND CONCRETE SURFACES

Grind concrete surfaces to remove concrete laitance and other surface contaminates prior to applying Sika Primers

3.12 MASK

Mask adjacent surfaces alongside joints to prevent contamination. Mask off any surfaces which would be difficult to clean if smeared with sealant, or where excess sealant could not be neatly trimmed off or removed.

3.13 VENTILATION

Ensure adequate ventilation for sealant applicators during the preparation and application of sealant work.

Application - sealants

3.14 FINAL PREPARATION

Prepare joints in accordance with approved **Sika** (NZ) Ltd cleaning methods.

3.15 INSTALLATION BACKING ROD

Insert a Sika PEF backing rod to the specified depth within the cleaned and prepared joint to provide a solid base for the sealant application.

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The diameter of the Sika PEF backing rod should be 25% larger than the gap width and compressed evenly into the joint using a blunt instrument to avoid puncturing or damaging the rod. Do not twist the rod during application. Punctured rod may lead to 'out-gassing' which can cause the bubbling during sealant curing.

The rod should be consistently and evenly installed without any gaps. The midpoint of the installed rod should be sitting at the specified depth for each joint.

3.16 PRIMING

Use **Sika** supplied/recommended primers. Allow to cure for **Sika** recommended time (minimum and maximum). Refer to **Sika** for instructions if maximum cure time is exceeded before sealant is applied. Do not contaminate bond breakers with primer.

Allow primer to dry as recommended by the manufacturer. Do not prime more than can be completed in one day. Prevent contamination of the primed surfaces prior to applying sealant.

3.17 SEALANT APPLICATION

Sika sealants are supplied ready to use, insert the cartridge / uni-pack into a sealant pressure gun. After the necessary substrate / joint preparation and priming, extrude uniformly the selected sealant into the joint cavity.

Apply sealant to ensure full contact with the substrate on each side of the joint with no voids or pockets of entrapped air. There should be a minimum amount of overfill.

3.18 SEALANT TOOLING & FINISHING

Tool sealant as soon as practical after application and prior to the sealant surface forming a skin. Tool sealant face firmly to compact into the joint to form a smooth, flat or concave profile, to give the desired effect when cured.

Tooling must be carried out carefully, ensuring that the sealant minimum depth profile is not compromised.

A compatible tooling agent or fresh clean water can be used sparingly to assist with the smoothing of the tooled surface. Do not use products containing solvent, alcohol or fuel, as these products will inhibit the curing of the sealant.

Remove masking immediately after tooling and remove excess sealant from adjoining surfaces before sealant surface starts to skin. Refer to the relevant and current Product Data Sheet for information on curing times. Note skinning times are temperature dependent.

Any cured sealant can only be removed mechanically and care must be taken to avoid damage of surrounding surfaces.

3.19 FINISHING

Remove masking immediately after tooling and before sealant surface starts to skin. Remove excess sealant from adjoining surfaces before the sealant has set, using the cleaning materials and methods required by **Sika**, leaving surfaces clean and the sealant runs undamaged.

3.20 SURROUNDING WORK

Leave surrounding surfaces in a neat, clean condition with no evidence of spill over.

Application - PU foam

3.21 VOID FILLING

Prepare substrate and fill void with polyurethane foam in accordance with Sika requirements and quality control programmes. Fill deep cavities in several layers, allowing each layer to cure before applying additional layers.

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Completion

3.22 CLEAN UP

Clean up as the work proceeds.

3.23 LEAVE

Leave work to the standard required by following procedures.

3.24 REMOVE

Remove masking tape, used packaging and waste products from the site.

4 SELECTIONS

Exterior sealants - roofs

4.1 SEALANT - ROOFING AND PLUMBING

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Colorsteel Roof
Primer:	n/a
Product:	Sikasil® Roofing and Plumbing
Application area:	Joints, Gutters, Vents, Flashings,
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

Exterior sealants - walls

4.2 SEALANT - WEATHER SEAL

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Aluminium Facade, Metals, Concrete, Masonry, Stone, Timber
Cleaner/primer:	Sika Activator -205 (non porous substrates) or Sika Primer-3N (porous substrates)
Product:	Sikaflex® AT-Facade or Sikaflex MS
Application area:	Weather and air seal
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

Exterior sealants - windows/doors

4.3 FLEX. SEALANT OVER PEF ROD - WINDOW / DOOR AIR SEAL

Location:	Exterior windows and doors - refer drawings
Application detail:	Exterior or interior sealing of facade joints and air seals - horizontal or vertical joints
Product:	Sikaflex® MS or similar approved.
Product colour:	Black or grey
Joint width:	10mm minimum to 35mm maximum - for weather seals 6mm minimum to 35mm maximum - for air seals
Substrate:	Non-porous substrates: aluminium composite panels, metal, coated metal, windows etc
Primer/cleaner:	Sika Aktivator 205 - for non-porous substrates or Sika Primer 3N - for porous substrates
Backing:	Sika PEF Backing rod - (diameter - 25% wider than joint)
Approved alternatives	**Alternative flexible sealant can be used when compliant with the joinery and building underlay, tapes. Contractor to confirm suitability prior to substitution. Any documentation / minor variations or changes required for the BCA is the responsibility of the contractor.**

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PEF Rod

4.4 PEF ROD WITH SEALANT

Location:	As and where required to fulfil the intent of the drawings
Product:	Thermakraft WindowWorm or equal approved, Cylindrical flexible foam closed cell polyethyelene (PEF) backing rod with approved Sealant over- refer note below
Application area:	Weather and air seal
Sealant:	Refer above 4.3 Sealant for Windows and Doors

Interior wall / ceiling sealant

4.5 SEALANT - PLASTERBOARD GAP FILLING

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Plasterboard
Primer:	N/A
Product:	Sika Fast Gaps
Application area:	Board joints To fulfil the intent of the drawings and there requirements
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

Interior wall and ceiling board bonding

4.6 ADHESIVE - WALLBOARD

Location:	As and where required to fulfil the intent of the drawings
Substrate:	plasterboard, timber, concrete, masonry, metal
Product:	Sika® Nailbond® SB
Application area:	Wall and ceiling board to frame bonding To fulfil the intent of the drawings and there requirements
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

Interior sealants - wet areas

4.7 SEALANT - WET AREA

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Powder coating, Plastics, Ceramic
Primer:	n/a
Product:	Sikasil® NG or approved Mapei sealant suitable to use with selected wet area waterproofing.
Application area:	joints between shower, bath, basin floor and wall
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit), also refer to any Homestar requirements for Sealants**
General:	**Any Silicone sealants to the Wet area must have a mould-inhibitor.**

4.8 ADHESIVE - SHOWER PANELS

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Acrylic
Primer:	n/a
Product:	Sika Showerbond
Application area:	Bond between acrylic shower panel and timber frame
Note:	**All sealants are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

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Void fillers

4.9 VOID FILLER - REFER SPEC

Location:	As and where required to fulfil the intent of the drawings
Substrate:	Refer to Sika for Approved applications and surrounding materials
Primer:	n/a
Product:	Sika Boom
Application area:	Window / Door Gaps and to wall framing Nogs in between full studs where and as required (interior wall junctions and external triple stud comers) refer typical details
Note:	**All fillers are to be approved with the referring substrates and claddings, - refer to the manufacturers literature (Man Lit)**

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4821 FLASHINGS

1 GENERAL

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

Documents

1.1 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Requirements

1.2 QUALIFICATIONS

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

1.3 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.4 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1, Table C.1.1.1 and NZBC E2/AS1, Table C.1.1.1A: Material selection.

1.5 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1, Table C.1.1.1A: Material selection, to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

1.6 DESIGN

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

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2 PRODUCTS

2.1 FLASHING MATERIALS

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

2.2 FLASHING FABRICATION

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

2.3 FIXINGS

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

2.4 JOINTS - SEALANTS

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

2.5 JOINTS - SOLDER

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

3 EXECUTION

Conditions

3.1 DELIVERY

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

3.2 STORAGE

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

3.3 HANDLING

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

3.4 SUBSTRATE

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

3.5 PROTECT

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

3.6 CONFIRM LAYOUT

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

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

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

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Refer to NZBC E2/AS1, Table 4.5.1.1: General dimensions of metal flashings and other flashings as listed, for general dimensions of flashings.

3.9 FIXINGS

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

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

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

3.10 JOINTING - SEALANTS

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

3.11 JOINTING - SOLDER

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

3.12 FINAL INSPECTION

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

Completion

3.13 PROTECT

Protect new work from damage.

3.14 REPLACE

Replace all damaged or marked elements.

3.15 LEAVE

Leave work to the standard required for following procedures.

3.16 REMOVE

Remove debris, unused materials and elements from the site.



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4 SELECTIONS

Cladding Flashings

4.1 FLASHING - WINDOW HEAD WITH STOPENDS

Location	Window Head
Type:	0.70mm BMT aluminium
Size:	Formed to suit the intent of the details provided - Minimum of 20° min slope, 5mm Anti-capillary gap to cladding, 100mm Upstand
Finish:	Powder coat system to match joinery and Colour
Stopend:	10mm turnups, terminating at the inside face of the cladding as per E2 Section 9.1.10.4, and extend head flashing 20mm min each side of the opening
Brick Note:	Aluminium flashings are not compatible with Brick cladding. Allow to substitute in accordance with NZBC E2 table 21 and 22

4.2 FLASHING - DOOR HEAD WITH STOPENDS

Locations:	Door Head
Type:	0.70mm BMT aluminium
Size:	Formed to suite details provided
Finish:	Powder coat system to match joinery and Colour
Stopend:	10mm turnups, terminating at the inside face of the cladding as per E2 Section 9.1.10.4, and extend head flashing 20mm min each side of the opening
Brick Note:	Aluminium flashings are not compatible with Brick cladding. Allow to substitute in accordance with NZBC E2 table 21 and 22

4.3 FLASHING - WINDOW SILL

Location:	Where required and as specifically shown on the details
Type:	0.70mm BMT aluminium
Size:	Formed to suit details provided
Finish:	Powder coat system to match joinery and Colour
Note:	Sill flashing to extend behind the line of the aluminium frame with 8mm min upstand
Brick Note:	Aluminium flashings are not compatible with Brick cladding. Allow to substitute in accordance with NZBC E2 table 21 and 22

4.4 FLASHING - EXTERNAL CORNER

Location:	Exterior cladding external corners
Type:	0.55mm BMT Zincalume Steel Base
Size:	Refer to specific cladding selections for requirements, if not shown the minimum requirement is to be 50 mm x 50 mm in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam or as specified in the adjoining material cladding manual
Note:	10mm hook on edge to prevent water tracking

4.5 FLASHING - EXTERNAL CORNER MOULD

Location:	Exterior cladding
Material:	0.55mm BMT Zincalume Steel Base
Size:	75mm x 75mm x 90 degree angle minimum; refer to cladding specific selections
Finish:	Colorsteel Maxam or as specified in the adjoining material cladding manual
Note:	10mm hook on edge to prevent water tracking

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4.6 FLASHING - INTERNAL CORNER

Location:	Exterior cladding internal corners
Material:	0.55mm BMT Zincalume Steel Base
Size:	Refer to cladding specific selections
Finish:	Colorsteel Maxam or as specified in the adjoining material cladding manual
Note:	10mm hook on edge to prevent water tracking

4.7 FLASHING - VERTICAL FLAT BACK SOAKER

Location:	Back flashing to vertical cladding translations
Material:	0.55mm BMT Zincalume Steel Base
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam or as specified in the adjoining material cladding manual
Note:	10mm hook on edge to prevent water tracking

4.8 FLASHING - HORIZONTAL CLADDING JUNCTION

Location:	Horizontal Cladding Junction, and as where required by the drawings and details
Material:	0.55mm BMT Zincalume Steel Base
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Note:	10mm hook on edge to prevent water tracking

4.9 FLASHING - SILL TRAY WITH 8MM MIN. UPSTAND AND SLOPED END DAM. EXTEND BACK PAST LAST LINE OF JOINERY PROFILE.

Location:	Where required and as specifically shown on the details
Type:	0.55mm BMT Zincalume Steel Base
Size:	Formed to suit details provided
Finish:	Colorsteel
Note:	Sill flashing to extend behind the line of the aluminium frame with 8mm min upstand.
Brick Note:	Aluminium flashings are not compatible with Brick cladding. Allow to substitute in accordance with NZBC E2 table 21 and 22

Roof Flashings

4.10 FLASHING - RIDGE

Location:	Roof Ridge, and as where required by the drawings and details
Material:	0.55mm BMT Zincalume Steel Base - Ridge Cap, notched edge/ folded
Size:	Minimum of 200mm either side of ridge and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam and or to match roofing type

4.11 FLASHING - VALLEY GUTTER

Location:	Roof valleys, and as where required by the drawings and details
Material:	0.55mm BMT Zincalume Steel Base
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam and or to match roofing type
Note:	10mm hook on edge to prevent water tracking

4.12 FLASHING - EAVE

Location:	Roof and Guttedr edge
Material:	0.55mm BMT Zincalume Steel Base
Finish:	Colorsteel Maxam and or to match roofing type
Note:	10mm hook on edge to prevent water tracking

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4.13 FLASHING - CAP

Location:	As and where required by the drawings and details
Material:	0.70mm BMT Zincalume Steel Base
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam to match wall colour

4.14 FLASHING - BARGE

Location:	Roof barges/ fascia and as required by the drawings and details
Material:	0.55mm BMT Zincalume Steel Base
Type:	0.55mm Colorsteel Kick out or birds beak barge covering two full crests; colour and material to match roofing
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam to match wall colour
Note:	10mm hook on edge to prevent water tracking

4.15 FLASHING - APRON

Location:	Roofs and as required by the drawings and details
Type:	0.55mm BMT Zincalume Steel Base
Finish:	Colorsteel Maxam
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Note:	10mm hook on edge to prevent water tracking, Tapered stopend to divert apron flashing into gutter

4.16 FLASHING - ROOF BACK FLASHING

Location:	Roofs and as required by the drawings and details
Type:	0.55mm BMT Zincalume Steel Base
Colour	Colorsteel Maxam
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7,pan - to cover two full crests either side of penetration
Note:	Extend past penetration 200mm

4.17 FLASHING - SADDLE

Location:	As required by the drawings and details
Type:	0.55mm BMT Zincalume Steel Base OR STAINLESS STEEL. Refer architectural details.
Colour	Colorsteel Maxam or Unpainted SS
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7

Penetration Flashings

4.18 FLASHING - ROOF PIPE PENETRATION

Location:	Roof Pipe Penetration's and as required by the drawings and details
Pipe Penetrations:	Hydroflow or equal approved
Type:	Rooftite, sized to suit pipe
Note:	Install as per manufacturer's instruction

4.19 FLASHING - WALL VENT

Location:	Wall pipe Penetration's and as required by the drawings and details
Type:	0.7mm Pre finished aluminium (not with Brick) or Prefinished 0.55 BMT Colorsteel
Size:	Formed to suite details provided

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Custom Flashings

4.20 FLASHING - CUSTOM

Location:	Refer to the details and drawings
Type:	0.70mm BMT Zincalume Steel Base
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Colorsteel Maxam

4.21 FLASHING - WELDED

Location:	Refer to the details and drawings
Type:	Allow for a 1.6mm ‘custom aluminum welded flashing’ designed to suit and intent of weather protection form elements as shown on the drawings
Size:	Formed to suit details provided, and in accordance with NZBC E2 - Table 7
Finish:	Powdercoat
Note	Also refer to the drawings and details for the intent of all flashing's, All flashing are to comply with NZBC E2 as a minimum requirement. Also refer to the details for specifically dimensioned flashing sizes.
Compatibility:	Aluminium flashings are not compatible with Brick cladding. Allow to substitute in accordance with NZBC E2 table 21 and 22

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5113G PLASTERBOARD LININGS

1 GENERAL

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

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:

GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021)
GIB® Curveline Specification and Installation Manual for Curved Walls and Ceilings
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems

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BRANZ Appraisal 394 (2025) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems

Manufacturer/supplier contact details
Company: Winstone Wallboards
Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

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

1.7 FIRE RATING REQUIREMENTS

Provide the GIB® fire resistant rated garage boundary wall systems. Refer to SELECTIONS for system/FRR.

1.8 SOUND INSULATION REQUIREMENTS

Provide the GIB® Noise Control Systems. Refer to SELECTIONS for system/STC. Include for forming and treating of perimeters of openings and penetrations in the elements to ensure the specified performance. Ensure absence of adjoining flanking paths.

Compliance

1.9 COMPLIANCE - BRANZ APPRAISAL 289

GIB® Fire Rated Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 289.

1.10 COMPLIANCE - BRANZ APPRAISAL 427

GIB® Wet Area Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 427.

Performance

1.11 BRACING REQUIREMENTS

Braced wall systems to NZS 3604 when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems and/or GIB Ezybrace® Bracing Design Software
- GIB Ezybrace® Bracing Supplement Document
- GIB Ezybrace® for Steel Frame Housing (NASH) Software (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

Refer to drawings for location and type.

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2 PRODUCTS

2.1 SURFACE FIRE PROPERTIES - UNFINISHED BOARD

All GIB® unfinished plasterboard sheet materials achieve a Group Classification of, Group 1-S to NZBC C/AS2, Table 4.12.1.1: Maximum permitted Group Number for internal surface finishes, following testing in accordance with ISO 5660.1 and ISO 5660.2.

Materials

2.2 GIB® PLASTERBOARD

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

GIB® Standard plasterboard
GIB Wideline® plasterboard
GIB Ultraline® high quality surface plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard
GIB Toughline®
GIB Toughline® Aqua

2.3 GIB® COVING

GIB-Cove® plasterboard coving. Refer to SELECTIONS for profile and size.

Components

2.4 GIBFIX® ANGLES

GIBFix® Angles, 45mm x 45mm angles, 2.4m or 2.7m long.

2.5 SCREWS

GIB® Grabber® drywall type screws as follows:

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

Refer to GIB® requirements for appropriate details.

2.6 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.7 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.8 CONTROL JOINTS

GIB® Rondo® P35 control joints.

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

Accessories

2.9 ADHESIVE

Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive

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GIBFix® All-Bond solvent based wallboard adhesive

2.10 JOINTING COMPOUND

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

2.11 JOINTING TAPE

GIB® jointing tape.

2.12 ACOUSTIC SEALANT

GIB Soundseal® ultra low VOC water based highly flexible acoustic sealant.

2.13 FIRE/ACOUSTIC SEALANT

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

2.14 GAP FILLER

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 LEVELS OF PLASTERBOARD FINISH

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

3.4 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

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

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

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

3.5 PROTECTION

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

Application

3.6 INSTALL CEILING BATTENS

Install to GIB® Rondo® Ceiling Batten Systems requirements.

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3.7 INSTALL GIBFIX® ANGLES

Install GIBFix® Angles to the wall and ceiling junctions to the GIBFix® Framing System requirements. Install GIBFix® Angles before installation of GIB® plasterboard linings.

Run GIBFix® Angles as continuous lengths between framing members. If joints are necessary for the GIBFix® Angles, overlap the angles by a minimum of 300mm and fix as per manufacturers requirements. When jointing GIBFix® Angles, locate the shorter section at the top of the stud.

3.8 LINING WALLS AND CEILINGS GENERALLY

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

3.9 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.

3.10 BOARD INSTALLATION FOR GIBFIX® SYSTEM

Fix the GIB® plasterboard to the GIBFix® Angle side over the stud first and then fix the GIB® plasterboard to the GIBFix® Angle only side (not over the stud). If the GIBFix® Angle only side must be fastened off first, provide additional fixings for the GIBFix® Angle to the stud, to the manufacturers requirements.

3.11 FORM NOISE CONTROL SYSTEMS

Form to GIB® Noise Control Systems requirements.

3.12 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.13 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems

3.14 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.15 INSTALL COVES

Install to GIB-Cove® literature using GIB-Cove® Bond.

3.16 INSTALL TAPE-ON TRIMS

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

Finishing

3.17 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion & Commissioning

3.18 COMPLETION MATTERS

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



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4 SELECTIONS

10mm GIB Plasterboard Walls

4.1 10MM PLASTERBOARD WALL - STANDARD

Location:	Refer to the drawings and documentation
Type:	10mm GIB Standard plasterboard (or equal approved alternative) refer to the drawings
Thickness:	10mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Fyreline / Noiseline/ Aqualine alternatives as required

4.2 10MM PLASTERBOARD WALL - WET AREAS

Location:	All wet areas, refer to the drawings and documentation
Type:	GIB Aqualine plasterboard to all wet areas walls (or equal approved alternative)
Thickness:	10mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

4.3 10MM PLASTERBOARD WALL - BRACING

Location:	Refer to the drawings and documentation
Type	GIB Braceline plasterboard (or equal approved alternative) -refer to the structural drawings and documentation
Thickness:	10mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

13mm GIB Plasterboard Walls

4.4 13MM PLASTERBOARD WALL - STANDARD

Location:	Refer the Drawings and documentation
Plasterboard type:	GIB Standard plasterboard (or equal approved alternative)
Thickness:	13mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

4.5 13MM PLASTERBOARD WALL - WET AREAS

Location:	Refer the Drawings and documentation
Plasterboard type:	GIB Aqualine plasterboard to all wet areas walls (or equal approved alternative)
Thickness:	13mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

4.6 13MM PLASTERBOARD WALL - BRACING

Location:	Refer to the drawings and documentation
Type	GIB Braceline plasterboard (or equal approved alternative) -refer to the structural drawings and documentation
Thickness:	13mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

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13mm GIB Plasterboard Ceilings

4.7 13MM PLASTERBOARD CEILING - STANDARD

Location:	Refer the Drawings and documentation
Plasterboard type:	GIB Braceline plasterboard (or equal approved alternative) -refer to the structural drawings and documentation
Thickness:	13mm
Finish Level:	4

4.8 13MM PLASTERBOARD CEILINGS - WET AREAS

Location:	Refer the Drawings and documentation
Plasterboard type:	GIB Aqualine plasterboard to all wet area ceilings (or equal approved alternative)
Thickness:	13mm
Finish Level:	4
Note:	Refer to the Acceptable GIB Alternatives as required

4.9 NOT USED

GIB bracing & co-ordination of structural drawings

4.10 PLASTERBOARD BRACING SYSTEMS

Refer to:	GIB Ezybrace® Systems (2016), GIB Ezybrace® Systems (2011)
Coordination:	The Contractor shall co-ordinate between the structural drawings (Specifically braced walls and ceilings) against all required penetrations / cut outs and the like required by the sub-contractors prior to the start of any working involving the above. Any discrepancies are to be brought to the attention of Young + Richards immediately for their consultation. The contractor shall refer to the structural drawings and their bracing plan to ensure all aspects, intent, thickness of Gib and systems are meet in strict accordance to their requirements.

GIB Cove

4.11 PLASTERBOARD COVE

Location:	All internal wall ceiling junctions - refer the drawings and documentation
Size/brand/type:	90 mm Gib Cove Classic
Installation:	Installed as per GIB’s recommendations and specifications

Accessories

4.12 PLASTERBOARD TRIMS

Location:	All internal junctions as required by GIB’s recommendations and specifications
Brand/type:	GIB tape-on trims, paper, metal trims and controls joints as and where required by GIB’s recommendations and specifications

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4.13 GIB QUIET TIE

Location:	Refer to the structural Engineers drawings and documentation for requirements
Brand/type:	GIB quiet Tie - refer to the structural Engineers drawings and documentation for requirements
Note:	GIB Quiet Ties are not suitable for use with double timber frame wall systems that incorporate a GIB Barrierline central barrier.GIB Quiet Ties have been designed to provide connection between the studs and plates of double timber frame walls, whilst maintaining the system’s published noise control STC/Rw rating

4.14 GIBFIX® ANGLE

Brand/type:	GIBFix® Angles
Fixings:	GIB® Grabber® Dual Head Screws

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5151 TRIM - INTERNAL TIMBER

1 GENERAL

This section relates to simple lengths of trim fixed on site as of isolated internal members, with simple end joints.
It includes:

- timber

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery

2 PRODUCTS

Materials

2.1 TIMBER TRIM

To NZS 3610 and to profiles detailed on the drawings. Timber species, grade and treatment to NZS 3602.

Components

2.2 NAILS

Bright steel to dimension requirements of NZS 3604. Use galvanized where prone to dampness.

2.3 BRADS

Bright steel of a length three times the thickness of the member being fixed. Use cadmium plated where prone to dampness.

2.4 SCREWS, STEEL

Bright steel of a length to penetrate the substrate up to the shank. Use stainless steel in wet areas.

2.5 SCREWS, CHROME PLATED

Chrome plated of a length to penetrate the substrate up to the shank.

3 EXECUTION

Conditions

3.1 GENERALLY

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

3.2 STORAGE

Take delivery of trims undamaged and unmarked and store on site under cover, away from moisture, heat and direct sunlight in adequately ventilated area and clear of areas where work is in progress, to ensure materials are of the required standard when fixed in place.

3.3 ACCLIMATISE MATERIALS

Remove materials from packaging, separate and allow to acclimatise in the proposed installation area for 48 hours minimum prior to installation.

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3.4 ENSURE

Ensure that the substrate to trims will allow work of the required standard. If it does not, do not proceed until the substrate has been remedied.

Application - Generally

3.5 INSTALL TIMBER TRIM

Use full lengths. Fit with scribed internal joints, mitred external joints and, mitred and returned at stop ends. Fix plumb, level and true to line and face using nails or brads to suit. Leave secure and with no movement possible.

Finishing

3.6 PUNCH

Punch all nail heads below the face of trim ready to receive stopping, as specified under painting preparation.

3.7 COUNTERSINK

Countersink screw heads not less than 2mm below the faces of trim to be painted. Stop and finish off flush with the face, as specified under painting preparation.

3.8 PELLETING

Countersink screw head 6mm below the faces of trim which is to be clear finished. Glue in grain-matched pellets not less than 6mm thick and cut from matching timber. Finish off flush with the face.

Completion

3.9 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.10 PROTECTION

Protect the completed work and make good before any surface finish is applied.

3.11 REPLACE

Replace damaged or marked elements.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 UNTREATED TIMBER - ARCHITRAVE

Size:	40mm x 10mm
Profile:	Single Bevel to face the inside of the door frame
Grade:	Dressing
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	Untreated or preprimed
Species:	Radiata Pine

4.2 H3.1 TIMBER - JAMB LINER

Aluminium joinery size:	18mm Thick (Painted) to suit set out and thickness of linings
Locations:	Windows and doors
Profile:	SQD
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	H3.1
Species:	Radiata Pine
Note:	Grooved Jambs liners are not permitted, allow for H3.1 planted stop

4.3 H3.1 TIMBER - SILL LINER

Aluminium joinery size:	18mm Thick (Painted) to suit set out and thickness of linings
Locations:	Windows and doors
Profile:	SQD
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	H3.1
Species:	Radiata Pine
Note:	Grooved Jambs liners are not permitted, allow for H3.1 planted stop

4.4 UNTREATED AND PRECOATED TIMBER - SKIRTING

Size:	60mm x 10mm (Painted)
Profile:	Single Bevel
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	Primed and untreated
Species:	Radiata Pine

4.5 UNTREATED TIMBER - BALUSTRADE CAPPING

Size:	40mm x 18mm
Profile:	Bevelled Corncie
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	Untreated
Species:	Radiata Pine

4.6 UNTREATED TIMBER - JAMB LINER

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Interior door size:	Refer door schedule
Size:	18mm Thick (Painted) to suit set out and thickness of linings
Locations:	Interior Doors only
Profile:	SQD
Finish:	Dressed
Surface Finish:	Paint finished (ensure all cut ends are sealed prior to installation), refer to the Interior and exterior colour schedules
Treatment:	Untreated, primed or pre-primed
Species:	Radiata Pine

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5171G GIB® PLASTERBOARD FIRE & SOUND LININGS

1 GENERAL

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

- fire rated systems including lift shafts and ducting
- sound rated systems

1.1 RELATED WORK

Refer to 5113G GIB® PLASTERBOARD LININGS for standard linings

Refer to 5174G GIB® PLASTERBOARD IMPACT RESISTING LININGS for high impact linings
Refer to 5173G GIB® PLASTERBOARD RADIATION PROTECTION LININGS for radiation resisting linings

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FRR	Fire resistance rating
IIC	Impact insulation class
STC	Sound transmission class
AWCI NZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
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)

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

GIB® Site Guide (April 2024)
GIB® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021)
GIB Toughline® Aqua (July 2018)
GIB Rondo® Metal Batten System (September 2024)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB UltraFlex® high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) - GIB® Fire Rated Systems
BRANZ Appraisal 394 (2025) - GIB® Noise Control Systems

Manufacturer/supplier contact details

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

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Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.6 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

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

1.8 FIRE RATING REQUIREMENTS

Provide the GIB® fire rated systems. Refer to SELECTIONS for system/FRR.

Compliance

1.9 COMPLIANCE - BRANZ APPRAISAL 289

GIB® Fire Rated Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 289.

1.10 COMPLIANCE - BRANZ APPRAISAL 394

GIB® Noise Control Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 394.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

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

GIB® Standard plasterboard
GIB Ultraline® high quality surface plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® GIB Noiseline® dual purpose high density sound control plasterboard
GIB Aqualine® wet area plasterboard
GIB Toughline® plasterboard
GIB Toughline® Aqua plasterboard GIB (previously GIB Superline®)

Components

2.2 SCREWS

GIB® Grabber® High tread drywall screws.

GIB® Grabber® Self tapping drywall screws.
GIB® Grabber® Drill Point Fine Thread Screws.
GIB® Grabber® Laminator screws.

2.3 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims.

2.4 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims and edges or GIB® UltraFlex® high impact corner mould or GIB® Levelline® Tape on trim.

2.5 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

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Accessories

2.6 ADHESIVE

Timber frame and/or steel frame:

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

2.7 JOINTING COMPOUND

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

2.8 JOINTING TAPE

GIB® Paper Joint Tape

GIB® RocTape®

2.9 ACOUSTIC/FIRE SEALANT

GIB Fire Soundseal™ low VOC highly flexible multi use acoustic sealant.

2.10 GAP FILLER

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

Framing substrates shall be in accordance to AS/NZS 2589, GIB® Site Guide and GIB Fire Rated System and/or GIB Noise Control System literature.

Check timber framing moisture content is in accordance with requirements of AS/NZS 2589. Refer to NZBC E2/AS1 and GIB® Site Guide.

Timber framing:	18% maximum for fixing plasterboard to timber (8-12% recommended for fixing plasterboard to timber framing if air conditioning and/or central heating are to be installed)

3.4 LEVELS OF PLASTERBOARD FINISH

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

3.5 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

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

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

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

3.6 PROTECTION

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

Application

3.7 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide and in accordance to relevant GIB Fire Rated or Noise Control System. Sheet joins are touch fitted and shall occur over framing where required by system requirements. Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.8 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible. Ensure plasterboard orientation is in accordance to the relevant GIB Fire Rated or Noise Control System. Where a double layer of GIB plasterboard is required, ensure the outer sheets are offset from the inner layer in accordance with system requirements.

3.9 FORM FIRE RATED SYSTEMS

Form to GIB® Fire Rated Systems and Penetrations in GIB® Fire Rated Systems.

3.10 FORM CONTROL JOINTS

Form control joints to AS/NZS 2589 and GIB® Site Guide (September 2018).

3.11 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex® high impact corner mould literature and/or GIB® Levelline® to GIB® Site Guide (September 2018).

Finishing

3.12 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion

3.13 COMPLETION MATTERS

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

4 SELECTIONS

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

Fire rated wall systems

4.1 10MM PLASTERBOARD WALL - FYRELINE

Location:	Refer drawings
System:	Refer drawins
FRR:	30/30/30

Accessories

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5171RI RCS INTEGRA LIGHTWEIGHT CONCRETE INTERTENANCY SYSTEM

1 GENERAL

This section relates to the supply and installation of Resene Construction Systems INTEGRA Central Barrier Intertenancy System.

It includes:

- Integra Aerated Autoclaved Concrete (AAC) panels
- Adhesive plaster
- Aluminium brackets
- Components and accessories 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:

AAC	Autoclaved aerated concrete
FRR	Fire Resistance Rating
STC	Sound transmission class
Rw	Sound Reduction Index

Documents

1.2 DOCUMENTS

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

AS 1530.4	Methods for fire tests on building materials, components and structure - Fire-resistance tests for elements of construction
ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Measurement of airborne sound insulation

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

BRANZ Appraisal 1064 (2025) - Integra Central Barrier Intertenancy System
Integra Central Barrier Intertenancy System Technical Manual, Version 3 - February 2025
Integra Lightweight Concrete Intertenancy System, Timber Frame drawing register 34.00.00, 6 June 2025
Integra Lightweight Concrete Intertenancy System, Steel Frame drawing register 33.00.00, 21 May 2025
Resene Construction Systems Trade Spec™
Resene Construction Systems Project Guide

Manufacturer/supplier contact details

Company:	Resene Construction Systems
Web:	www.reseneconstruction.co.nz
Email:	help@reseneconstruction.co.nz
Telephone:	0800 50 70 40

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For INTEGRA Central Barrier Intertenancy System components supplied by Resene Construction Systems

- Provide this warranty on the Resene Construction Systems standard form (if unavailable, use

the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 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.

Compliance Information

1.8 COMPLIANCE - BRANZ APPRAISAL

The INTEGRA Central Barrier Intertenancy System has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1064.

Performance

1.9 SOUND RATING

The INTEGRA Central Barrier Intertenancy System has been tested to ISO 10140-2. Refer to SELECTIONS.

1.10 FIRE RATING

The INTEGRA Central Barrier Intertenancy System has been tested to AS 1530.4 and achieve FRR of 120/120/120.

2 PRODUCTS

Materials

2.1 INTEGRA AAC 50MM PANEL

50mm thick fibre-reinforced aerated concrete, 2200mm x 600mm panel.

2.2 PLASTERBOARD

Refer to relevant plasterboard section.

2.3 TIMBER FRAMING

Refer to relevant timber framing section.

Components

2.4 FIXINGS - TIMBER FRAMING

Resene Construction Systems 12g x 45mm and 75mm Galvanised screws with EPDM washer.

2.5 INTERTENANCY BRACKETS

Aluminium brackets, 50mm wide x 3mm thick with 75mm x 50mm legs and a sound & heat resistant dampener.

2.6 PSL AAC ADHESIVE

Plaster used for bonding AAC panels together, patching panels, and securing the panel to a concrete foundation. Supplied in 20kg bags.

2.7 FIRE RESISTANT MINERAL WOOL PACKING

Resene Construction Systems FireWool™, fire resistant mineral wool.

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2.8 INSULATION

Refer to relevant insulation section.

Accessories

2.9 ANTI-CORROSION COATING

Resene Galvo-Prime; brush-applied waterborne galvanised iron primer or Zinc-rich spray primer; solvent borne spray application.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Timber framing: 18% maximum moisture content

Installation - Generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with Integra Central Barrier Intertenancy System Technical Manual.

3.6 SERVICES

Conceal services within the timber framed section of the wall system, subject to the following constraints:

- A minimum of 10mm clearance to be maintained between any penetrations and the central barrier
- Penetrations to be no larger than 65mm diameter or 90mm x 50mm through the plasterboard lining
- No more than two penetrations per 600mm bay of framing to be made.

3.7 CUT PANELS

Cut panels using a circular saw with diamond tipped blade. Prime any exposed reinforcing steel using Resene Galvo-Prime, in accordance with manufacturer's instructions.

3.8 SETOUT INTEGRA PANELS

Setout INTEGRA panels prior to commencing installation. With panels oriented horizontally, setout in stacker bond or stretcher bond pattern.

Installation

3.9 FIT INTERTENANCY BRACKETS TO TIMBER WALL FRAMING

Following erection of framing to first side of the intertenancy wall install 2 Intertenancy Brackets per INTEGRA panel. Commencing from one end of the wall, position and screw fix first row of Intertenancy Brackets to every second stud using 12g x 45mm Galvanised screws with EPDM washer, brackets 300mm from finished floor level with face of bracket dampener set off the framing to the required cavity depth. Continue with subsequent rows of brackets at 600mm vertical centres.

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3.10 INSTALL INTEGRA PANELS

With panel oriented horizontally, apply AAC adhesive to underside of first panel using a spatula or broadknife. Lift and position panel against Intertenancy Brackets plumb and true to line. Drill 2mm - 3mm pilot hole through INTEGRA panel at each bracket and screw fix through panel into bracket with 12g x 75mm Galvanised screw with EPDM washer. Continue with next panels in the first row and subsequent rows above, applying AAC adhesive to underside and side faces of each adjoining panel and screw fixing to Intertenancy Brackets. Finish top row of panels as close to top plate as possible.

3.11 FIT INTERTENANCY BRACKETS TO SECOND SIDE WALL FRAMING

Following erection of second side of wall framing to enclose the INTEGRA panels, setout and fix Intertenancy Brackets staggered from brackets on the opposing side.

3.12 FIT FIREWOOL

Fill voids between INTEGRA panels and roofing underlay/sheathing with FireWool.

3.13 FIT WALL INSULATION

Refer to relevant insulation section.

3.14 INSTALL PLASTERBOARD WALL LININGS

Refer to relevant plasterboard section.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to www.reseneconstruction.co.nz.
Substitutions are not permitted to the following Resene Construction Systemsmaterials or components, unless stated otherwise.

RCS INTEGRA Central Barrier Intertenancy System - Timber framing

4.1 RCS INTEGRA CENTRAL BARRIER INTERTENANCY SYSTEM - INTA120a

Location:	IT wall - refer drawings
Type/brand:	Resene Construction Systems INTEGRA Central Barrier Intertenancy System
System:	INTA120a
FFR:	120/120/120
STC:	64
Rw:	62
Cavity depth:	20mm, refer drawings.
Framing:	Timber
Lining:	1 layer 10mm standard plasterboard each side
Insulation:	Refer drawings and insulation section, min R2.4 to match interior walls.

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5231 INTERIOR DOORS

1 GENERAL

This section relates to the supply and installation of interior:

- doors
- doors and frames

1.1 RELATED WORK

Refer to painting sections for finishes

Documents

1.2 DOCUMENTS

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

AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Specification for profiles of mouldings and joinery
NZS 4223.3	Glazing in buildings - Human impact safety requirements

Window & Glass Association NZ (WGANZ) documents:

PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

2 PRODUCTS

Materials - door and window frames general

2.1 TIMBER DOORS

To NZS 3602. Moisture content 10-14%. To NZS 3610.

Materials - doors general

2.2 TIMBER

To NZS 3602. Moisture content 10-14%. To NZS 3610. Solid or hollow core.

Materials - doorsets

2.3 STANDARD DOORSETS, SIDE HUNG DOOR

Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.

Refer to SELECTIONS.

2.4 STANDARD DOORSETS, SLIDING

Frames to profile as detailed and dimensioned, fitted with solid or hollow core door.

Refer to SELECTIONS.

Components

2.5 DOOR FURNITURE

Refer to 5521 HARDWARE for type and finish.

2.6 SCREWS

Stainless steel or non-corrodible metal. Length sufficient to penetrate into the background support up to the shank. Screws for fixing hinges, hardware or furniture to match the item being attached.

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2.7 NAILS

Length sufficient to penetrate into the background support at least half the nail length, except if into radiata pine then three-fifths their length.

2.8 DOOR HINGES

Size and gauge to carry door size and weight. 3 hinges per door.

Type:	Loose pin
Size:	89mm
Material:	Zinc-plated steel
Pin:	Loose-pin zinc-plated steel

2.9 INTERIOR SLIDING DOOR GEAR

To suit door size and weight and as detailed.

2.10 DOOR SKIN (FACINGS)

Doors skins as detailed and dimensioned.

Finish

2.11 TIMBER - PAINT FINISH

Factory applied coating system, also refer to Painting requirements under 6721

3 EXECUTION

Conditions

3.1 GENERALLY

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

3.2 DO NOT DELIVER

Do not deliver any elements which cannot be unloaded immediately into suitable storage conditions.

3.3 HANDLE

Handle, unload and store elements without distortion and avoiding pre-finished surfaces rubbing together, and contact with mud, moisture and other damaging materials.

3.4 PROTECT

Protect all elements against damage to arrises and glazing beads. Store frames and doors flat and away from moisture or direct sunlight.

3.5 FABRICATE DOORSETS

Fabricate doorsets and windows in the factory with doors hung, provision for furniture made, finishes applied and fully operable.

3.6 FABRICATE DOORS

Fabricate doors in the factory, with provision for door furniture.

3.7 CHECK ALL OPENINGS

To NZS 3604.Check all openings on site for size and standard of execution before installing window or door frames. Installation tolerances of windows subject to earthquake design to comply with AS/NZS 1170.1.

Assembly

3.8 FABRICATION GENERALLY

Manufacture and fabricate frames and doors as detailed. Install hinges and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

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Application - generally

3.9 FIXING FRAMES

Fix and assemble frames rigidly in place, plumb, level and true to line and face without distortion and with all opening sashes fully and easily operating. Fit architraves.

3.10 DISTORTION

Do not distort frames when wedging or other packing, or when tightening fixings. If necessary adjust packing and fixings to eliminate binding. Do not cut, plane or sand frames to remedy distortion.

3.11 FIXINGS

Fix frames so that nail heads are covered by applied stops and beads. Punch all nail heads below timber surfaces which will be visible in completed work. Ensure that at least one frame fixing is adjacent to each hanging point.

Application - doorsets

3.12 PROPRIETARY ELEMENTS

Fix in accordance with the door manufacturer's requirements.

3.13 INSTALLATION GENERALLY

Wedge frames into opening and fix through into the wall framing. Locate all wedges and fixing at hinge positions and opposite, with one fixing in the vicinity of the lock. Fixings concealed behind planted stops.

Hang doors on hinges, sliding or bi-fold gear as specified and to operate freely. Fit all hardware and door furniture.

3.14 TIMBER STUD WALLS - TIMBER FRAMES

Wedge into opening and nail through into the studs. All wedges and fixing to be at hinge positions and opposite, with one fixing in the vicinity of the lock.

3.15 BOTTOM CLEARANCE

Provide for specified floor coverings plus 5mm clearance at any point of swing. When floor covering is not specified, allow 25mm total.

For ventilated and/or air conditioned spaces allow 20mm clearance above finished floor coverings for supply/return air.

3.16 REMOVE DOORS

Remove doors from the frames if necessary to protect them, or for re-finishing, store safely and near completion refit them, all without any damage.

3.17 INSTALL PANELS

Prime rebates and beads, install sealant backing strips or silicone. Install dry beading to outside of panels as selected. Do not mitre corners of beads.

3.18 INSTALL FURNITURE

Install latches, locks and door furniture as scheduled.

3.19 CHECK

Check and adjust operation of all doors, hardware and furniture.

Application - windows

Completion

3.20 PROTECTION

Protect all finishes against damage from adjacent and following work.

3.21 REPLACE

Replace damaged, cracked or marked elements.

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3.22 TRADE CLEAN

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

3.23 LEAVE

Leave work to the standard required for following procedures.

3.24 REMOVE

Remove safety indicators and protective coverings, and wipe down all doorsets thoroughly to leave them perfectly clean. Remove all debris, unused materials and elements from the site.

4 SELECTIONS

Doors

4.1 INTERIOR DOORS - REFER SPEC

Locations:	Refer to the Door Schedule
Type:	Interior Superior Door EPS Core, H Grade
Material:	Polystyrene Core, 4mm MDF skin Paint Quality, flush finish
Door leaf size:	Refer to the Door Schedule
Door Size:	All internal doors are 860mm (W) x 1.98m (H) - except wardrobe, cupboard, or storage doors
Door Thickness:	38mm
Door finish / Colour:	Painted, refer to the Interior and Exterior colour schedule on the drawings
Hinge type/finish:	3 x equally spaced 90mm S/C hinges, loose pins , Radius edge (do not paint over)
Jambs:	Refer to 5151
General:	Doorstops for all doors
Gel Bumps:	Soft close Gel bumps required to all doors
Hardware:	Refer to Hardware Schedule under 5521
Handle Height:	1000mm above the FFL
Lifemark and Access Friendly Requirements:	All internal doors are to be a minimum of 860mm wide (810 Clear opening)
FUD/ACC Colour Selection:	The Contractor and sub-contractor are to ensure that on all FUD and Access Friendly units, that the colour provided on doors should achieve a differential Light Reflectance Value (LRV) of at least 30% as compared with the adjacent surface (wall)

4.2 WARDROBE SLIDING DOORS

Locations:	Refer to the Door Schedule
Type:	H.M. Cowdroy Sliding wardrobe doors, complete with snap strip, track, and all guides and EPS core
Door leaf size:	Refer to the Door Schedule
Door finish:	Painted, refer to 6700
Hardware	Refer to Hardware Schedule under 5521

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5313KL RONDO SYSTEMS

1 GENERAL

This section relates to the supply and installation of **Rondo Ceiling Systems.** It includes;

- Rondo KEY-LOCK Concealed Ceiling System
- Rondo XPRESS® Drywall Grid System
- Rondo Steel Stud Drywall Concealed Ceiling System
- Direct-fix or fully suspended applications
- Non-fire rated and fire-rated systems
- Bulkhead, curved ceilings
- Seismic and acoustic designs

1.1 RELATED WORK

Refer to the drawings

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc

Documents

1.3 DOCUMENTS

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

BPS	Building Product Specifications
NZBC B1/VM1	Structural design of buildings
NZBC B2/AS1	Durability provisions for building elements
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2785	Suspended Ceilings - Design & Installation
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4541	Automatic fire sprinkler systems
AS/NZS 4600:2005	Cold formed steel structures
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Rondo branded products against defects in materials under normal use. In addition, Rondo warrants that the Rondo KEY-LOCK® Suspended Ceiling Systems will remain structurally sound for a period of 15 years.

- Provide this warranty on the manufacturer/supplier standard form
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Provide evidence of experience, listing completed projects of similar size and complexity.

1.6 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Installation by a manufacturer accredited installer, using the manufacturer technical services. Installers are to be members of the AWCINZ. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

Provide evidence of experience, listing completed projects of similar size and complexity.

Performance

1.7 LOADING CODE REQUIREMENT

To AS/NZS 2785, comply with the requirements of; AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, NZS 1170.5, NZBC B1/VM1, as appropriate.

1.8 CERTIFICATION

Provide:

- Certificates and other evidence that the system complies with the standards of performance specified.
- Producer Statements.

1.9 FIRE RATING REQUIREMENT

Design the ceiling system so that together with the floor and ceiling lining system, to BPS, 8.2 Fire resistance. Refer to SELECTIONS.

1.10 ENVIRONMENTAL REQUIREMENTS

Durability to NZBC B2/AS1.

Performance - Wind (design by contractor)

1.11 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the wind pressure parameters of AS/NZS 1170.2. Refer to general section 1220 PROJECT for general details.

Contact Rondo Building Services Pty Ltd for their internal engineering design service or to facilitate Producer Statement - Design (PS1).
Refer to SELECTIONS specific design performance requirements.

Performance - Seismic (design by contractor)

1.12 SEISMIC - SPECIFIC DESIGN

Design the system and its anchorages/fixings to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5. Refer to general section 1220 PROJECT for general details. Contact Rondo Building Services Pty Ltd for their internal engineering design service or to facilitate Producer Statement - Design (PS1).

Refer to SELECTIONS specific design performance requirements.

2 PRODUCTS

Suspended ceiling system

2.1 KEY-LOCK DIRECT FIX CEILING SYSTEM

KEY-LOCK direct fix ceiling system to AS/NZS 2785, including suspension depths of up to 200mm. Furring channels, Direct fix clips for fixing to timber, steel and concrete, to carry ceiling sheets, light fixtures and air distribution elements to comply with NZS 1170.5.
Provide diagonal bracing to provide lateral stability if required. Perimeter trim, expansion joints and seismic joints etc. to AS/NZS 2785, as required.
Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

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2.2 FURRING BATTEN SECTIONS

16mm, 28mm, or 35mm furring/batten sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Components

2.3 DIRECT FIX CLIPS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.4 SECTION JOINERS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.5 WALL TRIM

Wall trim sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Accessories

2.6 FASTENERS DIRECT FIX

8g-16 x 25mm (minimum) self drilling wafer head screws for fixing to timbers detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

2.7 SCREWS

25mm x 6 gauge non-rusting Type S self-drilling and self-tapping bugle head screws as detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

Lining and Insulation

2.8 PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed to AS/NZS 2588. Refer to SELECTIONS for type and thickness.

2.9 LINING BOARD

Refer to SELECTIONS for type, thickness and finish.

2.10 INSULATION

Refer to SELECTIONS for type and thickness.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 SUBSTRATE

Ensure substrate is plumb, level and in true alignment. Do not start erection if the substrate will not allow work of the required standard. Complete any remedial work found necessary before framing erection.

3.4 COMMENCING THIS WORK

Commencing this work means the substrate is accepted as allowing work of the required standard.

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3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with electrical and mechanical work to avoid conflict between suspension members and luminaires, diffusers, pipework and ducting. Confirm the provision of extra hangers and fixings.
Ensure co-operation with work in and above the ceiling, including the marking of specific ceiling tiles below major access points to above-ceiling services. Colour coded markings to follow the standards laid down by mechanical and electrical services.
Services and other attachments, attached to or supported by the ceiling grid system to AS/NZS 2785, ensure that:

- items over 7.5kg and items under 7.5kg but falling greater than 3m, require a tether to AS/NZS 2785, anchored to structure.
- items attached to the ceiling grid must be under 10kg mass, items over 10kg cannot be attached to the grid and must be independently supported.
- unless designed otherwise, the ceiling systems total load of services and other attachments must not exceed 3kg/m².
- light fittings installed to AS/NZS 2785 and NZS 4219.
- ceiling system clearances to structure and services etc. that are not attached to the ceiling system, to be to NZS 4219, and/or NZS 4541 for sprinklers.

3.6 SITE CONDITIONS

Do not begin installation until the building is closed in, fully glazed, the roof watertight, and mechanical and electrical duct work above the ceiling completed. To AS/NZS 2785, Appendix C, site Conditions, Installation and Inspections.

Installation generally

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 SETTING OUT

Set out the framing work true to line and square before starting erection.

3.9 INSTALL

Installation to AS/NZS 2785 minimum standards, and the systems Design Manual requirements.

Allowance for support members:

- Space required by the loads on the system and the type of ceiling.
- For the installation of services and accessories, including ductwork, light fittings and diffusers.
- Additional back support or suspension members for the fixing of services and accessories to prevent distortion, overloading or excessive vertical deflection.
- For access for maintenance of services.

Allowance for a ceiling system where failure of any one suspension point does not cause a progressive failure of the ceiling.
Allowance for height adjustment with a length adjustment device at each suspension point, permitting length variation of at least 50mm.

If required, allow for notch grid members at the junction with the perimeter trim to make sure the ceiling lining lies flat on the perimeter trim. Do not attach the suspension system to the lip or flange of purlins.

Fix, erect and fit to finish rigid, plumb, square and true to line and face. Where components required cutting on site, use metal snips, fine-toothed band or hack saws. Adjust all suspension systems and clips by laser level until they are all level. Hangers and bracing are not to be fixed closer than 150mm to plenum building services.

Install all movement joints required.

Services support to conform to the following:

- If the service has not been designed to accept the ceiling load, do not fix suspension members to services (e.g. ductwork).
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the

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services.
- Do not support services terminals on ceiling lining, unless specified.

3.10 BULKHEADS

Form bulkheads to manufacturer requirements. Diagonally brace at regular intervals to provide lateral stability. In addition to the dead load of the bulkhead, all bulkheads should be designed for the following minimum loads:

- 0.25 kPa laterally.
- 0.15 kPa vertically.

3.11 INSTALL SEISMIC RESTRAINTS

Install ceiling system seismic restrains and bracing as required to prevent lateral movement and resist the imposed horizontal seismic force, to AS/NZS 2785.

3.12 PENETRATIONS

To AS/NZS 2785 and NZS 4219 generally, with sprinkler systems to NZS 4219 and/or NZS 4541.

Accommodate recessed light fittings, air conditioning outlets and other electrical and/or mechanical services that are fixed to or pass through the ceiling system. Provide independent support for these as necessary.

3.13 ISOLATE

Isolate dissimilar metals with neoprene sheeting, tape or pipe lagging.

3.14 INSULATION

Install insulation to insulation manufacturer and Rondo Building Services Pty Ltd requirements.

3.15 LINING

Fix and finish lining boards to manufacturer and Rondo Building Services Pty Ltd requirements.

Install services before lining. Stagger sheet joins.

3.16 ACCESSIBILITY

Provide access to the ceiling system and the in-ceiling and above-ceiling services so that maintenance and removal of any part can be carried out without damage to the ceiling system or panels.

3.17 PROTECT EXISTING WORK

Protect adjacent existing work from damage during the installation.

3.18 INSTALLATION

Install the system to AS/NZS 2785

Screw-fix sheets to furring channel sections at the centres required by the ceiling lining manufacturer. Stagger joints and fully support on furring sections and primary sections at centres to suit the load and Rondo installation manual.
Refer to 5113 PLASTERBOARD LININGS for plasterboard and stopping specification.

Completion

3.19 COMPLETION MATTERS

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

4 SELECTIONS

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GIB Rondo Ceiling Systems

4.1 RONDO CEILING SYSTEM - DIRECT FIX

Location:	Ceilings - refer to the drawings and documentation
Brand:	GIB® RONDO® METAL BATTEN SYSTEM
Batten:	GIB Rondo 310 Batten (35mm Depth)
Perimeter Trims:	To suit set outs and on site requirements
Fasteners direct fix:	To suit substrate and component selection, Contact Rondo Building Services Pty Ltd
Fire rating:	Refer to any accompanying fire report
Notes:	Direct Fix system to be used where batten required to brace truss or only 35mm batten required between truss/midfloor and ceiling. Where more than 35mm required, refer Section 4.2 below for clip and batten system.

4.2 RONDO CEILING SYSTEM - CLIP AND BATTEN

Location:	Ceilings - refer to the drawings and documentation
Brand:	GIB® RONDO® METAL BATTEN SYSTEM
Clips:	Rondo 311 Clip to suit where drop required of 0-30mm. Rondo 313 Clip to suit where drop required 0-130mm. GIB Quiet Clip to use in GIB Noise Control Systems.
Batten:	GIB Rondo 310 Batten (35mm Depth)
Perimeter Trims:	To suit set outs and on site requirements

FFR System

Suspended System

4.3 RONDO SYSTEM - SUSPENDED

Location:	Ceilings - refer to the drawings and documentation
Brand:	GIB / Rondo
Type:	GIB / Rondo Keylock system
Furring Channels (FC):	Gib Rondo 308/129 metal battens.
Top Cross Rail:	Gib Rondo 127 TCR
Perimeter Trims:	140/142 Furring Channel Track
Suspension Rod:	121
Suspension Clip:	2534
Note:	Refer to the manufacturers recommendations and specifications and allow for all requirements to complete a fully working system. Allow for Locking Keys and joiners against the wall for stability where required

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5433 PLYWOOD FLOORS

1 GENERAL

This section relates to the use of plywood sheets for floors.

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

Documents referred to in this section are:

BPS	Building Product Specifications
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed buildings

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

Requirements

1.3 QUALIFICATIONS

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

2 PRODUCTS

Materials

2.1 PLYWOOD

Radiata pine veneer ply to AS/NZS 2269.0, face sanded, grade as scheduled.

H3 CCA treated to AS/NZS 1604.1, when used as a wet area substrate. Confirm compatibility with adhesives being used with the waterproofing membrane. F11 grade to be used for flooring.

Components

2.2 NAILS

Refer to the plywood manufacturer's requirements for size and use.

15mm ply:	50mm x 2.8mm galvanized annular grooved flooring nails
17 - 21mm ply:	60mm x 2.8mm galvanized annular grooved flooring nails
25mm ply:	75mm x 3.15mm galvanized annular grooved flooring nails

Jolt head nails to be used for exposed (clear finished) plywood.

2.3 SCREWS

Counter-sunk screws, stainless steel for treated plywood, minimum Class 3 or stainless steel for untreated plywood. Refer to the plywood manufacturer's requirements for size and use.

15mm ply:	No. 8 x 40mm
17mm ply:	No. 10 x 40mm
19 - 21mm ply:	No. 10 x 45mm

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25mm ply: No. 10 x 50mm

2.4 ADHESIVE

Polyurethane adhesive to American Plywood Association specification AFG 01.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

3.2 ROUTINE MATTERS

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:	as recommended by supplier. % maximum

3.4 SUBSTRATE

Do not commence work until the framing is plumb and level, in true alignment and to suit the floor manufacturer's requirements.

Ensure framing suits the required laying pattern.

3.5 EXPANSION JOINTS - LARGER FLOORS

Lay flooring to allow for a large expansion gap for large floor areas to manufacturer's requirements. Locate as shown, under internal walls where possible.

Application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 SUPPORT AND JOINTS - SQUARE EDGE SHEETS

Fully support edges and joints on square edged sheets.

3.8 FIXING PLYWOOD SHEETS

Fix sheets to the plywood manufacturers requirements and NZS 3604, section 7.2.3, **Wood-based Sheet Flooring**. Lay sheets in a staggered layout, face-grain of sheet at right-angles to support and with sheets in square, true alignment and plane.

3.9 WET AREAS

Ensure plywood is structural grade treated to H3 or H3.2 (CCA treated) to AS/NZS 1604.1.
Plywood substrates must have moisture content not more than 18% before installing membrane.
With primed/sealed face and edges.

NOTE: Treated plywood must be allowed to breath for a minimum of 7 days before installation of membrane. Fixing must be to manufacturer's specifications.
LOSP treated plywood must not be used.

Requirements if used for:
Flooring: Stress grade F8, minimum thickness 18mm with framing at minimum 400mm centres both ways, or min 21mm with framing at 600mm centres both ways. Fixing, glue and stainless steel screws.
Floor Overlay: Stress grade 8, minimum thickness 12mm.

3.10 ADHESIVE FIXING

Apply a 10mm adhesive bead to joists.

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3.11 FIXINGS

Minimum 10mm, maximum 15mm from the edge, 150mm centres along edges and 300mm centres on intermediate supports.

Completion & Commissioning

3.12 COMPLETION MATTERS

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

4 SELECTIONS

4.1 PLYWOOD - FLOORING

Location:	Refer architectural drawings
Brand/grade:	CD
Stress grade:	F11
Thickness:	19mm
Treatment:	Untreated, use H3 for wet areas
Fixing:	Screw and adhesive or nail and adhesive. .

4.2 ADHESIVE

Type:	As recommended by plywood manufacturer

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5511 JOINERY & CABINETRY FIXTURES

1 GENERAL

This section relates to custom joinery fittings and cabinetwork, purpose made in a factory and fitted on site.

Documents

1.1 DOCUMENTS REFERRED TO

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

AS/NZS 1859.1	Reconstituted wood based panels - Specifications - Particleboard
AS/NZS 1859.2	Reconstituted wood based panels - Specifications - Dry processed fibreboard
AS/NZS 1859.3	Reconstituted wood based panels - Specifications - decorative overlaid wood panels
AS/NZS 4386.1	Domestic kitchen assemblies - Kitchen units
AS/NZS 4386.2	Domestic kitchen assemblies - Installation

1.2 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

2 PRODUCTS

2.1 SUSTAINABLE TIMBER

This project uses FSC Certified sustainable timber.

Abbreviations and definitions:

FSC

- Forest Stewardship Council

FSC Forest Management (FM) Certification

- A forest management unit independently FSC inspected and certified that it complies with the internationally-agreed FSC Principles.

FSC Chain of Custody (COC) Certification

- COC certification applies to those who process, transform or trade forest products, providing a guarantee about the production and source of FSC-certified products and tracking the production and distribution of the products.

Organisation website details

FSC website:- https://nz.fsc.org/en-nz

FSC suppliers lists:- https://info.fsc.org/certificate.php#result

Materials

2.2 TIMBER BOARDS AND FRAMES

Boards and frames carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

2.3 PLYWOOD PANEL

Urea-formaldehyde resin hot-press bonded timber veneers, select grade interior.

2.4 MEDIUM DENSITY FIBRE BOARD

Urea-formaldehyde resin bonded wood fibre sheet to AS/NZS 1859.2.

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2.5 MEDIUM DENSITY FIBRE BOARD - MELAMINE VENEER

Urea-formaldehyde resin bonded wood fibre sheet to AS/NZS 1859.2 and AS/NZS 1859.3 veneered both sides with melamine sheet.

2.6 PRE-FINISHED BACKING BOARD

Urea-formaldehyde resin bonded fine wood fibre sheet to AS/NZS 1859.2 and AS/NZS 1859.3, veneered one side with melamine sheet.

Minimum thickness: 6mm

Components

2.7 BENCHTOPS

As detailed on the drawings and as required for specified fittings and appliances.

2.8 PRIME STONE

Prime Stone, an engineered quartz stone and resin compacted panel with either a honed non-reflective matt surface finish, textured leather finish or polished. 20mm or 30mm thick, sheets 3200mm x 1600mm with square edge profile. Available in more than 20 colours. Refer to SELECTIONS for colour range.

2.9 CARCASE CONNECTORS

One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap.

2.10 CARCASE FASTENERS

Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location.

2.11 CONCEALED HINGES

All-metal zinc alloy with automatic spring and screw-fixed. Door stops of plastic foam with self adhesive backs, or plastic buttons clear or coloured to match unit.

2.12 FLAP HINGES

All-metal, flush-fitted and screw-fixed with no gap when the flap is down.

2.13 FLAP STAY

All-metal, slide/folding and screw fixed.

2.14 DRAWER RUNNERS

Under mounted type, precision running ball-mounted full extension, bright steel finish system.

Accessories

2.15 ADHESIVES

As approved by the manufacturer for the timber product or pre-finished timber product joint being used.

3 EXECUTION

Conditions

3.1 JOINERY FIXTURES GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Take responsibility for the completed joinery fixtures including fittings included within fixtures and the on site installation.

3.2 DOMESTIC KITCHEN ASSEMBLIES

Unless otherwise specified / detailed, domestic kitchens to be constructed to AS/NZS 4386.1 and installed to AS/NZS 4386.2

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3.3 SITE MEASURE

Site check and confirm dimensions after wall linings have been fixed. Verify positions of electric power outlets, wiring to light fittings included in joinery fixtures, water supplies and waste pipe locations.

3.4 SHRINKAGE

Arrange jointing and fixing so that shrinkage in any part and direction does not impair the strength or appearance of the finished work or damage the adjoining work.

3.5 TOLERANCES

Provide reasonable tolerances at connections between the joinery fittings and the building fabric so that any irregularities are adequately compensated for in the site fixing.

3.6 NATURAL FINISH TIMBER

Select timber for match or uniformity or symmetry of colour or grain of adjacent pieces. Finish to same standard on all faces.

Conditions - site

3.7 TRANSIT

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather.

3.8 DELIVERY

Deliver fittings to the site only when floor, wall and ceiling surfaces are in place and the fittings can be immediately placed in their final location.

Assembly

3.9 MACHINING

Carry out machining within the practices required for the particular timber, wood product or pre-finished wood product being used. Machine drill holes, cut recesses and form joints ready for assembly to the componentry manufacturer's requirements. Ensure work is accurate, square and true to line.

3.10 MAKE CUT OUTS FOR APPLIANCES AND FITTINGS

Obtain fitting templates from the appliances and other fittings to be installed within joinery fixtures and bench tops. Ensure appliances and fittings can be installed with the required tolerances and clearances. Where bench tops are being provided under other work sections, provide templates and confirm dimensions to others.

3.11 ASSEMBLY

Carry out gluing, dowelling, and other operations necessary for the proper assembly of the fittings as detailed with fixings concealed unless detailed otherwise. Scribe fit adjustable shelves with 4 shelf pins to each and with force fit pin holes at 50mm maximum centres in solid cheeks. Construct drawers and using groove mounting runners, fit them with 3mm clearance into drawer space. Hang doors on concealed hinges with 115 degree openings except where detailed for 170 degrees.

3.12 GLUE JOINTS

Use glue joints where provision for shrinkage is not required. Cross-tongue or otherwise reinforce. Surfaces in contact to have an even sawn or planed finish and be free of contamination. Mix, apply and set to the glue manufacturer's requirements with adequate pressure applied to ensure intimate contact that will be maintained while the glue sets.

3.13 CONNECTOR JOINTS

Locate and drive connectors to the board manufacturer's requirements. Fit plastic trim cap where detailed. Conceal or hide from sight other connector heads.

3.14 FASTENER JOINTS

Locate and drive connecting bolts to the board manufacturer's requirements. Form joint and fit and rotate centric sphere connector to finish it rigid and tightly fitting over the whole length of the joint.

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Application

3.15 FIXING ON SITE

- Scribe fit and conceal fix rigidly in place square, level, plumb and true to line and face as detailed and to the required standard.
- Assemble fittings on-site if brought in sections.
- Fit counter and bench tops and upstands.
- Complete with moveable parts in place and freely moving in their proper range.

3.16 PROTECT

Protect finished surfaces from damage, particularly benchtops.

Completion

3.17 REPLACE

Replace damaged or marked elements.

3.18 LEAVE

Leave work complete, clean and without blemish and to the standard required by following procedures.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 KITCHEN - CABINETS & DOORS

Kitchen -Standardised

Location:	Kitchen - refer to the drawings and or internal elevations
Backing Board:	Laminex Melteca Low-pressure laminate (both sides) on 12mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate (Environmental Choice NZ certified) Colour is to be White
Doors / Drawers:	Laminex Melteca low pressure laminate (both sides) on 18mm ECNZ-licensed medium density fibreboard (MDF) moisture resistant (MRF)(Environmental Choice NZ certified)
Doors / Drawers Width:	Maximum width of 450mm
Child Latch	Include a child-resistant catch, preferably beneath the sink.
Toe Kick:	100mm-high (minimum) toe-kick.
Handles:	Jaeco 150mm Centres Steel ‘D’ Handle in chrome, horizontal, with finger-clearance and finger grip (150 x 25mm finger-clearance)
Cutlery Insert:	Provide a cutlery insert tray for the top drawer.
Pantry:	Pantry has 5x full-width fixed shelves with Laminex Melteca Low-pressure laminate (both sides) on 18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate
Set Down:	Kitchens are required to have a heat-proof set-down that is located adjacent to the stove or oven.
Colour:	Refer to the Interior and Exterior colour schedule on the drawings

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Kitchen - Lifermark

Location:	Lifermark and Full universal Design (FUD) Kitchens - refer to the drawings and or internal elevations
Backing Board:	Laminex Melteca Low-pressure laminate (both sides) on 12mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate (Environmental Choice NZ certified) Colour is to be White
Doors / Drawers:	Laminex Melteca low pressure laminate (both sides) on 18mm ECNZ-licensed medium density fibreboard (MDF) moisture resistant (MRF)(Environmental Choice NZ certified)
Doors / Drawers Width:	Maximum width of 450mm
Child Latch	Include a child-resistant catch, preferably beneath the sink.
Toe Kick - Accessible:	250mm-high (minimum) toe-kick for ACC units
Handles:	Jaeco 150mm Centres Steel 'D' Handle in chrome, horizontal, with finger-clearance and finger grip (150 x 25mm finger-clearance)
Cutlery Insert:	Provide a cutlery insert tray for the top drawer.
Pantry:	Pantry has 5x full-width fixed shelves with Laminex Melteca Low-pressure laminate (both sides) on 18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate
Set Down:	Kitchens are required to have a heat-proof set-down that is located adjacent to the stove or oven.
Access Friendly and FUD Requirements:	Under-bench storage is comprised solely of drawers, however, the one exception is under the kitchen sink, where a cupboard is acceptable.
Spatial Requirements:	Allow for a minimum of 300mm between internal corners and the opening-edge of appliances Allow for a minimum of1.5m of clearance in front of benches and appliances.
Access Friendly Requirements:	Allow for a dishwasher space, There is 300mm between internal corners and the opening-edge of appliances. Under-bench storage is comprised solely of drawers.
Colour:	Refer to the Interior and Exterior colour schedule on the drawings
Contrasting Colour Selection:	The Contractor and sub-contractor are to ensure that on all FUD and Access Friendly units that there is an appropriate and 30% LRV colour-contrast between all bench-tops and cabinetry in strict accordance with Lifemark Requirements.

4.2 KITCHEN - STAINLESS STEEL BENCHTOP

Location:	Social House Dwelling Kitchens - refer to the drawings and or internal elevations
Finish:	Formica High-pressure laminate in selected colour
Substrate:	2x18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate (Environmental Choice NZ certified)
Width:	600mm
Edge thickness:	37mm (2 x 18mm subframe)
Edge profile:	Square Edge. To be confirmed by client.
Colour/Finish:	2B Finish Standard Unpolished. To be confirmed by client.
Upstand:	100mm Formed upstand. To be confirmed by client.

4.3 KITCHEN - ENGINEERED STONE BENCHTOP

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Location:	SHO Dwellings Kitchens - refer architectural drawings.
Supplier:	**Prime Panels™** - a business unit of New Zealand Panels Group
Brand/type:	**Prime Panels™** Stone
Benchtop size:	Maximum panel size 3200mm x 1600mm x 30mm or 20mm
Benchtop profile:	Square edge
Colour:	Fox Glacier - to be confirmed by client.
Finish:	Polished.

4.4 KITCHEN - CARCASE CONNECTORS

Manufacturer:	Hettich or equal approved
General:	Hinges must provide a 115 - 170 degree opening and are recess-mounted, allow for 3x per under-bench leaf and 4x to doors over bench height

4.5 KITCHEN - CARCASE FASTENERS

Manufacturer:	Hettich or equal approved
General:	Carcase fasteners to be surfeit counter-sunk wood screws with no visible fixings on the front or sides

4.6 KITCHEN - DRAWER RUNNERS

Manufacturer:	Hettich or equal approved
General:	must provide soft-close function

4.7 SHELVING - WARDROBE

Location:	All Wardrobes - refer to the drawings
Wardrobe Rails:	Allow for wardrobe shelving and rails as required by KOHC KO-459, specifically 20mmØ galvanised pipe or an extruded aluminium rail. Allow for mid-rail support where the rail is longer than 1.2m, provide. The rail should be mounted below the wardrobe shelf and that Removable-rails are not permitted.
Shelving Notes:	Each wardrobe has a 400mm-deep shelf across the full width of the wardrobe. Securely-fixed 70 x 25mm (minimum) rails along shelf back and ends. 40 x 20mm pine stiffener under the front edge. Install at 1.65m above floor level.
Shelf Finish:	Laminex Melteca Low-pressure laminate (Environmental Choice NZ certified)
Colour:	Colour is to be White
Shelf Substrate:	18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) carcass/ substrate (Environmental Choice NZ certified)
Access Friendly Shelving Additional:	The wardrobe shelf has an adjustable height of 1.0-1.65m above the FFL.

4.8 SHELVING - LINEN CUPBOARD

Location:	All Linen Cupboards - refer to the drawings
Type:	Linen cupboard to have x 5 fixed full-width x 400mm-deep shelves; spaced at 360mm (maximum) centres vertically and with 10mm gaps between boards.
Finish:	Natural Timber
Substrate:	Shelves to be made of 70 x 20mm solid timber slats. Screw-fix boards to 70 x 20mm rails at ends.

4.9 SHELVING - HWC CUPBOARD

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Location:	All HWC Cupboards - refer to the drawings
Type:	At least one full-depth and full-width shelf. 70 x 20mm solid timber slats spaced with 10mm gaps between each slat. Screw-fixed to 70 x 20mm rails at ends.
Finish:	Laminex Melteca Low-pressure laminate (Environmental Choice NZ certified)
Colour:	Colour is to be White
Substrate:	18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) substrate (Environmental Choice NZ certified)

4.10 SHELVING - CUPBOARD

Location:	All Cupboards - refer to the drawings
Type:	3 x 400mm-deep shelves; full-width of cupboard.18mm (minimum) pre-finished, low-pressure laminate with 2mm PVC edging. Securely-fixed to 70 x 20mm (minimum) rails along back and ends. Bottom shelf to be positioned 1.25m above the finished floor level.
Finish:	Laminex Melteca Low-pressure laminate (Environmental Choice NZ certified)
Colour:	Colour is to be White
Substrate:	18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) substrate (Environmental Choice NZ certified)

4.11 SHELVING - LAUNDRY

Location:	All Laundrys - refer to the drawings
Type:	1 x 250mm-deep shelf; full-width of Laundry made out of 25mm (minimum) pre-finished, low-pressure laminate with 2mm PVC edging on proprietary brackets 1500mm above ffl - COS. Fixed into solid fixing
Finish:	Laminex Melteca Low-pressure laminate (Environmental Choice NZ certified)
Colour:	Colour is to be White
Substrate:	18mm ECNZ-licensed medium density fibreboard (MDF), moisture resistant (MRF) substrate (Environmental Choice NZ certified)

4.12 CEILING HATCH

Location:	Allow for a ceiling hatch the to the unit, preferably in a circulation space - refer to the drawings
Type:	Complete with supporting sub frame and timber edge trim, Hatch made from 12mm plywood, at least 600mm x 600mm and Fixed closed with security screws to stop easy access.
Colour:	Paint Finished to match ceiling
Note:	It is not permitted to locate the ceiling access-hatch over a stair; within a wardrobe; or in a bedroom.

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5521 HARDWARE

1 GENERAL

This section covers the supply and installation of door and window hardware and furniture.

1.1 RELATED WORK
Refer to the Drawings

Documents

1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS.

Requirements

1.3 SUPPLIER
A specialist in the supply of hardware, employing an experienced architectural hardware representative available to assist during the course of the hardware installation.

2 PRODUCTS

2.1 DOOR HARDWARE
Refer to SELECTIONS for product selection.

2.2 WINDOW HARDWARE
Refer to SELECTIONS for product selection.

Components

2.3 FIXINGS
Provide matching fixings, including screws, clips, bolts and brackets for hardware supplied.

3 EXECUTION

Conditions

3.1 RETAIN
Retain hardware in the manufacturer's original packaging. Ensure that units are complete with fixings and installation instructions. Label each unit separately with its hardware number and door/window number to match the submitted and approved schedule.

3.2 PACKAGE
Package required hardware units in clear plastic and label each package with its hardware and door/window number and location to match the drawings and the submitted and approved schedule. Place packages in cartons selected for "level", "location", and/or "sector" and label the packages and the cartons similarly.

3.3 STORE
Store hardware packages in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

Installation

3.4 INSPECTION
Before starting the hardware installation, check frames, doors, sashes and adjacent finishes are ready for the proper installation of the hardware.

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3.5 LOCATE

Locate hardware units at heights and/or locations shown on the drawings, or as required to comply with relevant Codes and Standards. Before proceeding, confirm any dimension not shown or known.

3.6 CUTTING AND FITTING

Carry out cutting and fitting of the substrate necessary for installing any hardware unit before painting or finishing of that surface. Remove hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.7 INSTALL HARDWARE

Install each hardware unit in accordance with the hardware manufacturer's requirements using templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with all moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.8 ADJUST

Adjust and check each operating hardware unit for correct and smooth functioning. Replace those units that cannot be adjusted if they do not function correctly. Clean units and adjoining surfaces upon completing their installation. Only use lubricant if and when recommended by the hardware manufacturer/supplier.

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave work with parts fully and freely working and to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

3.12 PROTECT

Protect hardware units from damage or marking.

3.13 FINAL ADJUSTMENT

Where hardware is installed more than a month prior to project completion, return and make a final check and adjustment of hardware units to ensure they are operating correctly, fitted properly and are undamaged.

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4 SELECTIONS

4.1 HARDWARE - ENTRY LATCHSET

Locations:	Front and Rear single Entry doors
Door handle:	L1220/1221/70SC SYMPHONY 1200 SERIES ROSE FULL SET WITH LEVER 70 SATIN CHROME
Handle Height:	1000mm above the FFL
Latch:	Yale MC12SS DEADBOLT DC 60/70MM DP STAINLESS STEEL
Door viewer	Yale Securi-viewer, satin-chrome (MC96SC); suitable for timber, uPVC, or aluminium, 35-60mm-thick doors (to suit door thickness-confirm prior to installation and ordering)
Door Stop:	NZH DS 1087 Floor Mount Door Stops, or equal approved

4.2 HARDWARE - PASSAGE LATCHSET

Locations:	Bedrooms
Door handle:	Schlage, Medio Series Centra, lever and rose and all trim, complete with latch set and plates, satin chrome
Handle Height:	1000mm above the FFL
Function:	Passage set (4551684)
Doorstop	NZH DS 1087 Floor Mount Door Stops, or equal approved
General:	Mount lever type handles 1.0m above FFL

4.3 HARDWARE - PRIVACY LATCHSET

Locations:	Bathrooms
Door handle	Schlage, Medio Series Centra, lever, trim and rose, complete with privacy latch set and plates, satin chrome
Handle Height:	1000mm above the FFL
Function:	Privacy set (4551686)
Doorstop	NZH DS 1087 Floor Mount Door Stops, or equal approved
General:	Mount lever type handles 1.0m above FFL

4.4 HARDWARE - GENERAL STORAGE LATCHSET

Location:	Wardrobes, linen cupboards, general storage cupboards, and hot water cylinder cupboards
Door handle	Schlage, Medio Series Centra, Dummy lever-type
Handle Height:	1000mm above the FFL
Function:	Dummy trim (4551687)
Catches:	2 x Miles Nelson 332CP Soft close counter sunk magnetic catch flush with the top edge of the door
General:	Mount lever type handles 1.0m above FFL

4.5 HARDWARE - WARDROBE SLIDING DOOR HARDWARE

Location:	Wardrobes etc
Robemaker sliding door	COWDROY, TT580 / TT582 / TT583 / TT584 / TT586 - To suit Intent as shown on the drawings
Track system	Head guide channel, Double bottom track, Snap strip and roller sleeves and all required accessories to fulfil the intent of the drawings and provide a fully functional Wardrobe door system

Aluminium WIndow Hardware

4.6 HARDWARE - KANSO WINDOW HARDWARE

Location:	Exterior Windows
Manufacturer:	Schlage
Brand:	Kanso Window Hardware
Type:	To be confirmed by Contractor and TRC representative, prior to fabrication

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Finish:	Powder coat
Colour:	To be confirmed by Contractor and Client

Aluminium Door Hardware

4.7 HARDWARE - KANSO EXTERIOR SLIDING DOOR HARDWARE

Location:	Exterior Sliding Doors
Manufacturer:	Schlage
Brand:	Kanso Door Hardware
Type:	To be confirmed by Contractor and Kāinga Ora representative, prior to fabrication
Handle Height:	1000mm above the FFL
Finish:	Powder coat
Colour:	To be confirmed by Contractor and Client

Masterkeying

4.8 MASTERKEYING

Requirement:	The contractor is to allow for all master keying requirements as typically required by TRC

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6221M MAPEI TILING SOLUTIONS

1 GENERAL

This section relates to the supply and installation of MBP (NZ) Ltd internal and external floor tiling systems.

It includes:

- primers
- screed and levelling compounds
- acoustic underlays
- waterproofing membranes
- adhesives
- grouts
- sealants

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
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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Mapei® Technical Manual - Tile Installer's Manual - Products for Ceramic Tiles (Sept 2016)
Mapei® Technical Manual - Cementitious adhesives for installing ceramic tiles and natural stone (Sept 2016)
Mapei® Technical Manual - Guide for the Installation of Ceramic Materials (Sept 2018)
Mapei® product Technical Data Sheets
BRANZ Appraisal 484 (2018) - Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes - Amended 6 October 2022
BRANZ Appraisal 485 (2018) - Mapelastic Smart and External Waterproofing Membranes - Amended 6 October 2022
Mapei® product BPIR

Manufacturer/supplier contact details

Company:	MBP (NZ) Ltd.

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Web:	www.mbpltd.co.nz
Email:	enquiries@mbpltd.co.nz
Telephone:	09 921 1994

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For Mapelastic AquaDefense, Mapelastic Smart and Mapegum WPS
10 years	For other Mapei ceramic tile products (excluding Ultracare 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 purchase

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 GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Waterproofing applicators to be approved by MBP (NZ) Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 COMPLIANCE - BRANZ APPRAISAL 484

Mapegum WPS, Mapelastic AquaDefense and Mapelastic Smart internal wet area membranes have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 484.

1.10 COMPLIANCE - BRANZ APPRAISAL 485

Mapelastic Smart external wet area membrane has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 485.

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicator approval certificate from the manufacturer / importer / distributor
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents

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Performance - slip resistance

1.12 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

The following walking surfaces have previously been tested for slip resistance, and comply with NZBC D1/AS1 requirements.

2 PRODUCTS

Levelling compounds

2.1 FIBERPLAN

Cement-based, fibre-reinforced, self-levelling compound for thicknesses from 3mm to 10mm.

2.2 ULTRAPLAN RENOVATION

Cement-based, fibre-reinforced, self-levelling compound for thicknesses from 3mm to 40mm.

2.3 ULTRAPLAN ECO

Cement-based, self-levelling smoothing compound for thicknesses from 1mm to 10mm.

2.4 NIVORAPID

Cement-based, thixotropic levelling mortar for thicknesses from 3mm to 20mm.

2.5 PLANITOP SMOOTH & REPAIR R4 ZERO

Cement-based, fibre reinforced levelling mortar for thicknesses from 3mm to 40mm.

2.6 PLANITOP FAST 330

Cement-based, fibre-reinforced levelling mortar with synthetic resin additives, for thicknesses from 3 to 30mm.

2.7 UC LEVELLER

Cement-based, self-levelling compound for thicknesses from 3mm to 70mm.

2.8 MAPECEM

Cement-based, rapid setting hydraulic binder for shrinkage-compensated screeds.

2.9 MAPECEM PRONTO

Cement-based, pre-mixed, rapid setting shrinkage compensated screed.

2.10 TOPCEM

Cement-based, hydraulic binder for shrinkage-compensated screeds.

2.11 PLANICRETE

Synthetic-rubber latex additive for use with cement based screeds and adhesives to improve mechanical and adhesive characteristics.

Primers

2.12 PRIMER 3296

Acrylic polymer based primer in water dispersion for porous substrates.

2.13 ECO PRIM T PLUS

Acrylic resin primer in water dispersion.

2.14 ECO PRIM GRIP PLUS

One component synthetic resin primer in water dispersion.

2.15 PLANISEAL MR

Two component water based epoxy primer/barrier hydrostatic resistant coating.

Waterproofing membrane

2.16 MAPEGUM WPS

One component synthetic resin-based paste in water dispersion liquid waterproofing membrane. Grey colour.

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2.17 MAPELASTIC AQUADEFENSE

One component synthetic resin-based paste in water dispersion liquid waterproofing membrane. Light blue colour.

2.18 MAPELASTIC SMART

Two component flexible cementitious liquid waterproofing membrane.

Adhesives

2.19 GRANIRAPID

Two component, cementitious adhesive with synthetic rubber latex. Classified C2FS1 to ISO 13007.1.

2.20 KERAQUICK MAXI S1

Cementitious adhesive. Suitable for application in layers up to 15mm thick. Classified C2FTS1 to ISO 13007.1.

2.21 KERAQUICK MAXI S1 & LATEX PLUS

Cementitious adhesive with flexible polymer water dispersion. Suitable for application in layers up to 15mm thick. Classified C2FS2 to ISO 13007.1.

2.22 KERABOND PLUS & ISOLASTIC

Cementitious adhesive with elastic polymer water dispersion. Classified C2TS2 to ISO 13007.1.

2.23 KERALASTIC T

Two component, polyurethane adhesive. Classified R2T to ISO 13007.1.

2.24 KERAFLEX MAXI S1 ZERO

Cementitious adhesive with synthetic resin. Classified C2TES1 to ISO 13007.1.

2.25 KERAPOXY ADHESIVE

Two component epoxy adhesive. Classified R2T to ISO 13007.1.

2.26 ADESILEX P10 & ISOLASTIC FOR MOSAICS

Two component cementitious adhesive with elastic polymer water dispersion. Classified C2TES1 to ISO 13007.1.

2.27 ULTRALITE S1 FLEX ZERO

One component cementitious adhesive with synthetic resin. Classified C2TES1 to ISO 13007.1.

2.28 ULTRALITE S2 T FLEX

One component thixotropic cement and synthetic resin based adhesive. Classified C2ES2 to ISO 13007.1.

Grouts

2.29 ULTRACOLOR PLUS

Cement-based, polymer-modified grout for joints from 2mm to 10mm, with water repellent DropEffect and anti-mould with BioBlock technologies.

2.30 KERAPOXY

Two component, chemical resistant epoxy grout for joints 3mm to 10mm wide. Classified RG to ISO 13007.3.

2.31 KERAPOXY EASY DESIGN

Two component, chemical resistant epoxy grout with anti-mould BioBlock technology for joints 3mm to 15mm wide. Classified RG to ISO 13007.3.

Components - waterproofing

2.32 MAPEBAND SA TAPE

Alkali resistant butyl self-adhesive waterproofing tape, 100mm wide roll.



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2.33 MAPEBAND SA GASKET
Alkali resistant butyl self-adhesive waterproofing gasket, 370mm x 370mm square.

2.34 MAPEBAND EASY TAPE
Alkali resistant rubber waterproofing tape with a non-woven fabric face and back, 130mm wide roll.

2.35 MAPEBAND EASY GASKET
Alkali resistant rubber waterproofing gasket with a non-woven fabric face and back, available 200mm x 200mm and 400mm x 400mm square.

2.36 MAPENET 150 REINFORCING MESH
Alkali-resistant fiberglass reinforcing mesh.

2.37 MAPETEX SEL REINFORCING FABRIC
Alkali resistant non-woven polypropylene reinforcing and anti-fracture fabric.

Components - cleaning

2.38 ULTRACARE KERANET EASY
Acid-based, pre-mixed general tile and grout cleaner.

2.39 ULTRACARE KERAPOXY CLEANER
Concentrated liquid detergent for removing epoxy grout.

Accessories

2.40 TRIMS
Tile trim, edge strips, floor finish divider strips and weather bars. Available in aluminium, brass and stainless steel. Refer to SELECTIONS.

2.41 MOVEMENT JOINT - ANGLE
Metal or PVC angle. Refer to SELECTIONS.

2.42 MOVEMENT JOINT - INSERT
Polyurethane or neoprene insert. Refer to SELECTIONS.

2.43 MOVEMENT JOINT - SILICONE SEALANT
One part, flexible silicone sealant, Mapesil AC for acetic cure or Mapesil LM for neutral cure. Refer to SELECTIONS.

2.44 MOVEMENT JOINT - POLYURETHANE SEALANT
Mapeflex PU40, one part flexible thixotropic polyurethane based sealant. Refer to SELECTIONS.

2.45 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

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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, Mapei technical data sheets, and to WMAI CoP recommendations. Surfaces to be clean, sound and free of dust, oil, grease, curing compounds or release agents.

3.6 APPLY PRIMER

Brush or roll primer over surface.

3.7 APPLY LEVELLING COMPOUND

Mix levelling compound to Mapei 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 minimum	cross fall for outdoor accessways in public areas to NZS 4121

3.8 APPLY WATERPROOFING MEMBRANE

Reinforce corners and penetrations with waterproofing tape. Mix waterproofing components to Mapei instructions. Trowel, brush or roll on liquid waterproofing membrane over prepared surface. Apply two coats to achieve required minimum total dry film thickness to Mapei product technical data sheet.

3.9 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.

3.10 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 junctions with floors, columns, nibs, 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.

3.11 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.

3.12 APPLY ADHESIVE

Mix adhesive to Mapei instructions. Spread adhesive over prepared surface with a notched trowel to Mapei recommended bed thickness.

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3.13 INSTALL TRIM

Press trim into wet adhesive.

3.14 INSTALL MOVEMENT JOINT ANGLE

Press angle into wet adhesive.

3.15 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 underside before laying into adhesive bed by spreading a thin layer of adhesive on the back of the tile to AS 3958.1. Remove a tile periodically during installation to check for correct adhesive coverage. Allow for grout joints between laid tiles to tile manufacturer's recommended width. Do not fix tiles over skinned adhesive. Promptly remove surplus adhesive from the tile surface.

3.16 APPLY GROUT

Mix grout to Mapei instructions. Work grout into joints with a rubber trowel to AS 3958.1. Allow the grout to firm up in the joint before wiping tile surface with a damp, dense sponge.

3.17 INSTALL MOVEMENT JOINT INSERT

Place insert between movement joint angles.

3.18 INSTALL MOVEMENT BACKING ROD & SEALANT

Place PEF backing rod into movement gap. Apply a continuous bead of silicone sealant over PEF backing rod.

Completion & Commissioning

3.19 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 SELECTED WALL TILES

Location:	Refer architectural drawings.
Supplier:	Refer architectural drawings.
Type:	Ceramic or porcelain.

4.2 SELECTED FLOOR TILES

Location:	Refer architectural drawings.
Supplier:	Refer architectural drawings.
Type:	Ceramic or porcelain.
Class	Class 2 - residential floor/wall tiles (suitable for light traffic e.g. bedrooms, bathrooms, hallways) Ensure slip resistance suitable for wet areas and tiled bathrooms.

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Tiled internal floors

4.3 MAPEI INTERNAL WATERPROOFING SYSTEM - REFER SPEC

, Location:	Refer architectural drawings.
Supplier:	MBP (NZ) Ltd.
Substrate:	Concrete
Levelling:	Mapecem or as required.
Primer:	Primer 3296
WPM:	Mapegum WPS
Adhesive:	Keraquick Maxi S1, Ultralite S1 Flex Zero or other Mapei adhesive suitable for selected tile.
Grout:	Ultracolor Plus
Grout colour:	Refer finishes schedule.
Approved alternative:	**Ardex WPM 001 or approved alternative. Contractors responsibility for ensuring waterproofing system suitable for selected tiles and substrates and any MVs or changes to documentation required by the BCA.**

Components

4.4 MAPEI WATERPROOFING DETAILING & REINFORCEMENT

Location:	Refer architectural details.
Supplier:	MBP (NZ) Ltd.
Edges/expansion joints:	Mapeband SA Tape
Penetrations:	Mapeband SA Gasket

Accessories

4.5 TILE EDGE TRIM

Location:	Refer details.
Supplier:	N/A
Type:	Tile trim, Edge trim
Material:	Brass or alum.

Spares & maintenance products

4.6 SPARES & MAINTENANCE PRODUCTS

Refer to the general section 1270 CONSTRUCTION for details of how spares and maintenance products will be handled. Provide the following spares and maintenance products:

Item:	Tiles
Quantity:	Spare tiles for home owner
Location:	Refer to 1270 CONSTRUCTION

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6311FF FORTE TIMBER OVERLAY SYSTEM

1 GENERAL

This section relates to the supply, laying and finishing of **Forté** range of timber overlay flooring. It includes:

- Prefinished Engineered Wood Flooring
- Acoustic underlay
- All associated accessories to complete the installation.

1.1 RELATED 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:

FSC®	Forest Stewardship Council®
PEFC	Program 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
NZBC C/VM2	Protection from fire
NZBC D1/AS1	Access routes
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS/NZS 1859.4	Reconstituted wood-based panels - Specifications - Wet-processed fibreboard
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 4586	Slip resistance classification of new pedestrian surface materials
ISO 4760	Laminate flooring — topical moisture resistance — assembled joint
ISO 9705.1	Reaction to fire tests - Room corner test for wall and ceiling lining products -- Part 1: Test method for a small room configuration

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Forté Timber Overlay Flooring System Design Guide 4.0
Forté Product Specification Sheets
Forté Timber Overlay Flooring System Installation Guide 3.0
Forté Acoustick-Mat Acoustic Underlay Installation Guidelines
E3 Alternative Solution Document 3.0
Forté Care & Maintenance Guide for Commercial Spaces
Forte Timber Flooring Care and Maintenance Guide Residential 3.0
TAMSA International Consult 733 Critical Radiant Flux reports
ISTS Test Reports: Slip Resistance Classification of New Pedestrian Surface Materials
CodeMark™ Certificate CMNZ70143-1 – Forté Timber Overlay Flooring System

Manufacturer/supplier contact details:

Company:	Innovate Group Limited T/A Forté
Web:	https://forte.co.nz/
Email:	info@forte.co.nz
Telephone:	0508 356 677

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years	Residential Structural Warranty on all Engineered Flooring Ranges
10 years	Commercial Structural Warranty on all Engineered Flooring

- Provide this warranty on the Forté standard form. Refer to https://forte.co.nz/ for warranty details and conditions.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation (by Forté approved installer)

- 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 – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved by Innovate Group Limited. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications. Refer to https://forte.co.nz/ for details of Approved Installers.

1.8 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide maintenance documentation in accordance with Forté Timber Flooring Care and Maintenance Guide Residential 3.0 as necessary for the Principal to maintain the works. Provide documentation no later than the date of practical completion or the date on which the Principal takes occupation of the works. Refer to https://forte.co.nz/ for care & maintenance.

1.10 HEALTH AND SAFETY

Refer to relevant Technical Data Sheets and Material Safety Data Sheets of moisture barrier & adhesives.

1.11 MAINTENANCE SCHEDULE

Ensure a maintenance cleaning schedule is put in place for commercial applications. For residential and commercial care and maintenance recommendations refer to https://forte.co.nz/.

Performance - wet areas

1.12 PROPOSED ALTERNATIVE SOLUTION - FLOOR SURFACE IMPERVIOUS / EASILY CLEANED

Refer to the Forté Alternative Solution Guidance for Timber Flooring (E3 Installations) within the specification Contract Appendix. This proposed Alternative Solution supports the use of Forté Timber Overlay Flooring Systems in limited wet area applications, through in-service history, testing, specific installation methods and design.

The proposed Alternative Solution requires flooring system installation in wet areas to be in accordance with both ATFA (Australian Timber Flooring Association) recommendations and the Forté Timber Overlay Flooring System Installation Guide 3.0, including PVA adhesive to plank joints and caulking silicone gap filler to seal the perimeter and any fixed items within the area.

1.13 TESTING MOISTURE CONTENT

Sample and test the substrate to ensure that moisture content is within the limits specified. Provide a written record.



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Performance - generally

2 PRODUCTS

2.1 FORTÉ ENGINEERED TIMBER COLLECTIONS

Forté Engineered Timber Collections: Artefact, Artiste Grande, Atelier, Custom, Indus, Loft, Moda, Smartfloor, Ultra, Urban and Villa are engineered flooring (real wood) composed of a hardwood veneer wear layer and a cross directional timber backing. Various widths, lengths and thicknesses depending on collection type.
Supplied in planks. Installation by direct stick. Matching stair nosings are available. Refer to SELECTIONS.

Accessories

2.2 ADHESIVES

Apply one of the following where a moisture barrier, sound reduction and bonding system are required:

- Selleys Liquid Nails Timberflex
- Mapei Ultrabond Eco S955 1K
- Ardex 480 MS.

2.3 ADHESIVES - JOINT SEALER FOR WET AREA APPLICATIONS

PVA D3 Adhesive used as a waterproof joint sealer to wet area applications.

2.4 SEALANT - FOR WET AREA APPLICATIONS

Timber floor silicone-free, paintable sealant / caulking suitable for wet area applications.

2.5 LEVELLING COMPOUNDS - TIMBER SUBSTRATE

Mapei Fiberplan - Ultra fast hardening self levelling smoothing compound with appropriate Mapei Primer to suit substrate.

2.6 FINISHING TRIM AND TRANSITION BARS

Brass or aluminium finishing trims and transition bars of varying profiles and finishes. Refer to Section 7 of the Forté Timber Overlay Flooring System Design Guide 4.0.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Store the timber flooring flat, in the original unopened packaging, in the areas it is to be installed in for at least 48 hours prior to installation, to allow the product to acclimatise to the room temperature and minimise the likelihood of any shrinkage or swelling.
Store timber out of direct sunlight, in a shaded and protected dry place (18°C to 25°C), away from walls and radiators.

Place stored packs on battens/ dunnage to minimise moisture absorption from the ground. Do not store the timber flooring outside.

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. Inspect the substrate to ensure it provides a suitable finish in accordance with the requirements of the Forté Timber Overlay Flooring System Installation Guide 3.0. Do not start laying if the substrate will not allow work of the required standard. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

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Check the sub-floor for evenness, not to exceed 3mm variation over a 3m length. If substrate unevenness still exceeds 3mm variation over a 3m length after surface preparation apply levelling compound.

Check for moisture content by hygrometer. Do not commence laying flooring until readings for the whole area are within acceptable levels as follows:

Timber substrate	8 -12% for air conditioned buildings
	10 -14% for intermittently heated buildings
	2 -16% for unheated buildings
Concrete substrate	70% relative humidity

If concrete substrate is above 70% Relative Humidity, apply selected moisture barrier. If timber substrate is above allowable moisture content, then wait to allow to dry out and re-test.

3.4 CHECK TIMBER

Check that the timber supplied is as specified. Check the moisture content of the timber flooring and subfloor to ensure it is at the required level for the installation environment.

3.5 DO NOT START

Do not start laying before the building is enclosed, doors are hung and lockable, wet work complete, full lighting available and in the case of air-conditioned buildings the air-conditioning operating for 6 weeks.

3.6 STARTING WORK

Starting work means the floor layer accepts the substrate as allowing work of the required standard.

3.7 TECHNIQUE DISCUSSION

Before beginning the installation, confirm the proposed layout of the timber, grain direction, any other visual considerations of the finished work and specified expansion requirements relating to the specified product.

Installation - generally

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 INSTALLATION GENERALLY

Execution and installation must comply with the requirements of the Forté Timber Overlay Flooring System Installation Guide 3.0. Refer to https://forte.co.nz/.

Installation - substrate preparation

3.10 PLYWOOD OR PARTICLEBOARD SUBSTRATE

Ensure substrate is minimum 18mm thick when over joists or minimum 15mm when over concrete. Clear substrate of debris, machine sand to remove surface contamination, then vacuum to remove dust.

Check the sub-floor for evenness, not to exceed 3mm variation over a 3m length. If substrate unevenness still exceeds 3mm variation over a 3m length after surface preparation apply levelling compound.

The moisture content difference between the timber substrate and the Engineered Timber Flooring should be no more than 4% . Do not install if the moisture content difference is greater than this. Carry out moisture test in accordance with the method described in the Forté Timber Overlay Flooring System - Installation Guide 3.0, section 3.3.

3.11 APPLY LEVELLING COMPOUNDS - TIMBER SUBSTRATE

If substrate unevenness exceeds 3mm variation over a 3m length after sanding apply levelling compound.

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Apply appropriate Mapei primer to suit substrate. Mix and apply by large metal trowel or rubber spreader Mapei Fiberplan self-levelling compound in accordance with manufacturer's requirements for smoothing and removing differences in level between 3 to 10mm to timber substrates.

Installation - timber overlay flooring

3.12 INSTALL FORTÉ ENGINEERED WOOD PLANKS - DIRECT STICK

Install Forté prefinished engineered wood flooring in accordance with Forté Timber Overlay Flooring System Installation Guide 3.0, using the direct stick (glue down) method. Refer https://forte.co.nz/

Apply Mapei Ultrabond ECO® S955 1K, Ultrabond ECO® 995 or Selleys Timberflex with a notched trowel following manufacturer's instructions. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using approved techniques. Install the flooring strictly in accordance with Forté stated requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles.
When underfloor heating is specified install pre-finished engineered wood flooring in accordance with the particular requirements of the Forté Timber Overlay Flooring System Installation Guide 3.0.

3.13 SEALING JOINTS - TO WET AREAS

Apply D3 PVA adhesive during installation to all joints between timber overlay planks, both along the length of plank and between the ends of planks to all wet area applications. For open plan spaces, this should extend 1.5m from each sanitary fixture and sanitary appliance. Refer to Forté Timber Overlay Flooring System Installation Guide 3.0 for details.

Installation - miscellaneous

3.14 LAYING - STAIRCASES AND LANDINGS

Check for moisture content and suitability of substrate prior to installation. Adhesive fix flooring and nosings to stair treads, risers and landings.

3.15 EXPANSION GAPS, PERIMETERS

Calculate expansion gaps strictly in accordance with Forte Flooring's requirements, to suit the environment, size of the installation and product type.

3.16 EXPANSION JOINTS

Cover by timber or aluminium trim to allow unrestricted movement of the flooring.

3.17 SEALANT TO PERIMETER - TO WET AREAS

After installation of timber overlay is complete apply water-resistant caulking silicone gap filler in accordance with the manufacturer's requirements and in accordance with Forté Timber Overlay Flooring System Installation Guide 3.0, to seal around the expansion gaps to perimeter and around any fixed items in the floor area. For open plan spaces, this should extend 1.5m from each sanitary fixture and sanitary appliance.

3.18 EDGES

Install skirting after installation of the timber floor covering to cover the required expansion gap.

Completion

3.19 FLOORING SURFACES

Leave flooring surfaces free of adhesive, dirt and debris. Vacuum off, damp mop with a low-foam neutral detergent and allow to dry.

3.20 PROTECT FINISHED SURFACE

Protect the surface using Protectaboard or similar approved until completion of the contract works, or until acceptance/sign-off by Contract Administrator. Refer to Forté Flooring for details.

3.21 COMPLETION MATTERS

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

4 SELECTIONS

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For further details on selections go to https://forte.co.nz/.
Substitutions are not permitted to the following, unless stated otherwise.

Forté Prefinished Engineered Flooring Plank

4.1 FORTE - PREFINISHED ENGINEERED FLOORING PLANK

Location:	Refer architectural drawings
Application:	Direct stick
Product/code no:	To be confirmed, Loft range or similar
Colour:	To be confirmed, Loft range or similar
Plank size:	193mm wide x 1830mm long
Plank thickness:	12mm with 2mm European Oak Veneer
Surface texture:	Extra light brushed
Finish:	UV Cured DuraMatte Lacquer
Surface fire:	Critical Radiant Flux 2.2kW/m²
Slip resistance:	42 SRV / 0.45 COF

Components

4.2 LEVELLING COMPOUNDS - TIMBER SUBSTRATE

Location:	For levelling timber substrates - where unevenness still exceeds 3mm variation over a 3m length after sanding
Primer:	Appropriate Mapei primer to suit substrate
Levelling:	Mapei Fiberplan self-levelling compound

4.3 ADHESIVES

Location:	For application of direct stick timber overlay flooring and if required for acoustic underlay
Product:	Mapei Ultrabond Eco S955 or Ultrabond Eco 995 or Selley Timberflex

4.4 JOINT ADHESIVES - FOR WET AREA APPLICATIONS

Location:	To all joints in timber overlay flooring in wet area applications
Product:	PVA D3 Adhesive

4.5 SEALANT - FOR WET AREA APPLICATIONS

Location:	To expansion gaps to perimeter and around any fixed items in the floor area to wet area applications
Product:	Forté recommend either Bona Gap Master or Aquaseal Flex
Colour:	Colour closest to floor colour. Contact Forte for options

4.6 FINISHING TRIM AND TRANSITION BARS

Location:	Refer drawings
Profile/size:	Refer to Forté Flooring for options
Material/finish:	Refer to Forté Flooring for options
Colour:	Refer to Forté Flooring for options

4.7 FORTÉ STAIR NOSINGS

Location:	Refer drawings
Product/Code No:	Refer to Forté Flooring for options
Size:	Refer to Forté Flooring for options
Surface texture:	Refer to Forté Flooring for options
Finish:	Refer to Forté Flooring for options

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6511 CARPETING

1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck).
It includes:

- carpet underlay
- woven sheet carpet

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2270	Plywood and blockboard for interior use
AS/NZS 2455.1	Textile floor coverings - Installation practice - General
BPS	Building Product Specifications

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 MOISTURE CONTENT OF CONCRETE SLAB

Concrete slab is be cured and dried to a relative humidity of not exceeding 75% or until the moisture content does not exceed 5.5%, in accordance with AS/NZS 2455.1, refer to section 6192 FLOORING SUBSTRATE PREPARATION.

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.7 NO SUBSTITUTIONS

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

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1.8 RESERVE MATERIAL
Supply reserve carpet, all suitably packaged for delivery and storage. Refer to SELECTIONS.

2 PRODUCTS

Materials

2.1 UNDERLAY
To AS/NZS 2455.1 Soft underlay and underlays manufacturer's requirements.
Refer to SELECTIONS for product selection.

2.2 CARPET
To AS/NZS 2455.1 Textile floor coverings.
Refer to SELECTIONS for product selection.

Components

2.3 BINDER BARS
Anodised aluminium section with fluted face.

2.4 DIVIDER STRIPS
Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.

2.5 EDGE GRIPPER
Timber/plywood to AS/NZS 2270 with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

2.6 STAIR NOSING
Refer to SELECTIONS for type.

Accessories

2.7 TAPE
To carpet manufacturer's requirements.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

3.2 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work. Ensure all fittings and fixtures around which the carpet is to be scribed are in place. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with AS/NZS 2455.1. Appendix B Do not commence laying carpet until readings for the whole area are within acceptable levels as follows:

Moisture Content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH

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3.3 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.4 TAPE

Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

3.5 LAYOUT

Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

3.6 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

Application - general / substrate preparation

3.7 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

3.8 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed.

Application - carpet laying

3.9 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.10 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to AS/NZS 2455.1, section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

3.11 LAYING TO STAIRS

Install on stairs in accordance with AS/NZS 2455.1.

3.12 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

Completion

4 SELECTIONS

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

4.1 CARPET UNDERLAY

Standard Underlay

Location:	All carpet locations.
Standard Brand:	Selected carpet underlay.
Thickness:	8mm, 69kg/m3, 1.8 x 15m rolls, red.

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4.2 CARPET

Location:	Refer drawings.
Brand:	Refer architectural finishes schedule.
Code:	Refer architectural finishes schedule.
Colour:	Refer architectural finishes schedule.
Type:	Refer architectural finishes schedule.
Thickness:	Refer architectural finishes schedule.
Installation method:	Smooth-edge to the perimeter, with threshold bars at junctions with other flooring types
Note:	Where they are adjacent, flooring must extend into wardrobes and storage and linen cupboards.

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7123 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

1.2 SPECIAL REQUIREMENTS

Contractor must ensure, and demonstrate with appropriate documentation, that all **Selections** shown in Section 4 meet the performance standards described and implied in Section 2 (PRODUCTS), unless a specific brand has been included, in which case refer to Section 1234 regarding Substitutions

Documents

1.3 DOCUMENTS

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

NZBC G4/AS1	Ventilation of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe fittings - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance

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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
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

1.4 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.5 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.7 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

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Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.8 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

1.9 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1 as modified by NZBC G12/AS3, Section 17, Testing and commissioning, for cold water.

- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 17.3.1 Hydrostatic test. Test storage tanks to AS/NZS 3500.1, 17.3.2 Storage tanks (except rain water tanks).

and

AS/NZS 3500.4 as modified by NZBC G12/AS3, Section 9, Testing and commissioning, for hot water.

- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9.3 Testing. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 Testing.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

1.10 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.11 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.12 GAS APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.



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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 fittings 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 STAINLESS STEEL PIPE

To NZBC G12/AS1, 2 Materials. Stainless steel pipes to AS 5200 Part 053 and fittings to AS 3688.

2.7 DE-ZINCIFICATION RESISTANT WATER SUPPLY SYSTEM COMPONENTS

All copper alloy components to comply with G12/AS1 clause 2.2.3 and AS 2345.

2.8 WATER METER

To the requirements of the network utility operator.

2.9 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.

2.10 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/ AS1 3.4 Backflow protection, 3.5 Containment Backflow protection, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection.

2.11 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

2.12 HEADER TANKS

Pre-formed black polyethylene or stainless steel tank, complete with access opening and lid and overflow tray.

2.13 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

2.14 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, NZS 4606.1, NZS 4606.2 and NZS 4606.3,electric storage cylinder, insulated and complete with required fittings.

2.15 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE

To NZS 4305, and NZS 4602, copper thermal storage cylinder insulated and complete with pressure reducing valve and required fittings.

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2.16 ELECTRIC HOT WATER CYLINDER, UNDER-SINK, LOW PRESSURE

To NZS 4305, and NZS 4602, copper thermal storage cylinder insulated and complete with required fittings.

2.17 ELECTRIC HOT WATER HEATER, INSTANTANEOUS TYPE

Instantaneous flow unit complete with required fittings to AS/NZS 60335.2.35.

2.18 ELECTRIC BOILING CYLINDER, WALL MOUNTED

To NZS 4305, wall-mounted boiling water heater in pre-finished cabinet, complete with tap draw off.

2.19 GAS HOT WATER HEATER, STORAGE TYPE

Insulated cylinder to NZS 4305 and Gas (Safety and Measurement) Regulations with an integral gas burner and flue.

2.20 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Continuous flow unit with an integral gas burner and flue to NZS 4305 and Gas (Safety and Measurement) Regulations.

2.21 HEAT PUMP WATER HEATER - INTEGRAL SYSTEM

Heat pump water heating system, with insulated storage cylinder and compressor/condenser /evaporator, complete with required fittings.

2.22 HEAT PUMP WATER HEATER - SPLIT SYSTEM

Heat pump water heating system, with insulated storage cylinder and separate compressor/condenser/evaporator, complete with required fittings. With flow and return pipe work for water between cylinder and heat pump. Insulated exposed flow and return pipe work.

Components

2.23 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZBC H1/AS1-AS2 and AS/NZS 3500.4.

2.24 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

Fire resistant accessories

2.25 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping systems of pipe penetrations through fire walls and floors.



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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

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

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - 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.

3.14 JOINTING STAINLESS STEEL PIPE

Proprietary stainless steel fittings to NZBC G12/AS1 and pipe system manufacturer's requirements.



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Application - Pipework installation

3.15 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.16 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.

3.17 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1.

3.18 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.19 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

3.20 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems

3.21 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation or NZS 4606 for Valve-vented systems.

3.22 SEISMIC RESTRAINTS - GAS WATER HEATING APPLIANCES

Gas appliances to be restrained to manufacturer's requirements, NZBC G11/AS1 and AS/NZS 5601.1.

3.23 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.

3.24 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZBC H1/AS1-AS2 Energy Efficiency, AS/NZS 3500.4, 8.2 Thermal Insulation, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.25 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.

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3.26 INSTALL LOW PRESSURE UNDER-SINK HOT WATER CYLINDER

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6.11 Water heater installation. Connect to sink tap.

3.27 INSTALL ELECTRIC HOT WATER HEATER, INSTANTANEOUS TYPE

To AS/NZS 3500.4.

Install the unit to the manufacturer's requirements, provide isolating valve on cold water feed.

3.28 INSTALL WALL-MOUNTED BOILING CYLINDER

Install to the cylinder manufacturer's stated requirements. Locate where shown.

3.29 INSTALL GAS HOT WATER HEATER, STORAGE TYPE

Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1, 6. 11 Water heater installation. Install flue in accordance with the manufacturer's details and requirements and, AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances). Refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.30 INSTALL GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1, 6. 11, Water heater installation. Install flue in accordance with the manufacturer's details and requirements and, AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances). Refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.31 INSTALL HEAT PUMP WATER HEATER - INTEGRAL SYSTEM

Install complete with the necessary fittings to the manufacturer's installation instructions.

3.32 INSTALL HEAT PUMP WATER HEATER - SPLIT SYSTEM

Install complete with the necessary fittings and pipe work, to the manufacturer's installation instructions.

3.33 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.34 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.

3.35 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.

Application - Fire resistant work

3.36 FIRE STOPPING SYSTEMS

Refer to 7382 FIRE STOPPING SYSTEMS for fire stopping devices for pipe penetrations through fire walls and floors.

Installation - valves

3.37 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.

3.38 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.

3.39 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.



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Completion

3.40 LABEL
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.41 CLEAN IN-LINE FILTER
Clean all in-line filters on completion of works.

3.42 REPLACE
Replace damaged or marked elements.

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

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

4 SELECTIONS

Water main

4.1 POLYETHYLENE WATER MAIN

Size:	25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 COPPER PIPE

Manufacturer:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"
Wall thickness:	Copper tube for water reticulation is available with a nominal bore of 15mm, 20mm 25mm (with wall thickness 1.02mm) and 32mm (with wall thickness 1.22mm) plus larger sizes. There is light gauge copper tube 15mm with 0.70mm wall thickness and 20mm with 0.90mm wall thickness. There is also 15mm and 20mm copper tube on the market which is pre-insulated with green microcellular foamed PVC.

4.3 PP-R POLYPROPYLENE PIPES

Manufacturer:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS, to provide 25 year guarantee

4.4 CROSS LINKED POLYETHYLENE PIPE

Manufacturer:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS, to provide 25 year guarantee

4.5 EXPOSED PIPES

Type:	Chrome plated copper pipe White polyethylene composite pipe
Accessories:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS Stainless steel hose braid fitted with stainless steel nuts Selected pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings

4.6 PIPEWORK INSULATION

Brand:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS, insulate all hot water pipes

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Hot water systems

4.7 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Refer to: Refer to Architectural drawing A3-00-9677. Refer to Design Guide.

Valves and accessories

4.8 MAIN ISOLATING VALVE

Location: Refer to civil drawings
Brand/type: To the requirements of the network utility operator.

4.9 FLOOR/ZONE ISOLATING VALVES

Location: In an accessible position.
Brand/type: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS

4.10 APPLIANCE ISOLATING VALVES - CONCEALED

Appliance: Appliances include dishwashers and washing machines.
Brand/type: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS

4.11 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance: Washing machine
Brand/type: Refer to tapware selections

4.12 TEMPERING VALVE

Location: Hot water cylinder - refer to drawings
Brand/type: To comply with NZBC G12: clause 4.13, a tempering valve will be needed for any hot water system

4.13 BACKFLOW PREVENTION DEVICE

Location: To the requirements of the network utility operator, and to hose taps.
Brand/type: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.14 IN-LINE FILTER

Location: Adjacent to the main isolating valve and positioned for easy access for cleaning
Brand/type: To the requirements of the network utility operator.

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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

Requirements

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 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.

1.5 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.6 NO SUBSTITUTIONS

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide all operations and manuals for the selected fixtures.

Provide this information prior to practical completion



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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 REQUIREMENTS INCLUDING AS/NZS 3500.2

Install to NZBC G1/AS1, AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3, NZBC G12/AS1, NZBC E3/AS1, AS/NZS 3500.2, as modified by NZBC G13/AS3, and to the fixture manufacturer's installation requirements for each component.

3.7 INSTALLATION SANITARY FIXTURES

Carry out preparatory and assembly work, including connections to supply and drainage services and the application of all required slurries/bedding and sealants in sequence.

Fit the sanitary fixture in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant.

Seal between all sanitary fixtures and floors, wall linings, fixtures and the tops they are in, the tops and wall linings, to NZBC E3/AS1, 3.2. Fixtures include toilets, urinals, baths, basins, tubs, sinks. Tops include, vanities, bath surrounds, sink benches, etc, and their upstands. Form joint or seal between shower bases or urinals and impervious wall linings to NZBC E3/AS1, 3.3.



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3.8 INSTALLING URINALS - WATERLESS

Ensure discharge will not go through metal pipework/drains. Install the cartridge in each unit, charge with fluid and test for proper operation.

3.9 INSTALLING SHOWER OR BATH DOOR AND SCREEN

To NZS 4223.3 and to the product manufacturer's requirements. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating.

3.10 INSTALLATION TAPWARE

In accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with NZBC G12/AS1, 6.14 Safe water temperatures.

3.11 SEAL SHOWER TAPWARE

Seal shower wall lining penetrations such as shower head, shower hose, mixer, taps etc to NZBC E3/AS1, Fig. 6.

3.12 SANITARY APPLIANCES

Install and provide all required connections to sanitary appliances in accordance with manufacturers requirements.

3.13 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES

Before enclosing, 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.

3.14 INSTALLING ACCESSORIES

Fit specified fittings firmly in place, all plumb and level.

Locate at heights and/or locations shown on the drawings, or as required to comply with NZBC G1/AS1. For any dimension not shown or known, request direction before proceeding

3.15 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.16 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion & Commissioning

3.17 COMPLETION MATTERS

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

4 SELECTIONS

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

WC Fixtures

4.1 TOILET SUITE

Refer architectural finishes and fixtures schedule for selections and specification.

4.2 BASIN - WC

Refer architectural finishes and fixtures schedule for selections and specification.

4.3 BASIN - WC MIXER

Refer architectural finishes and fixtures schedule for selections and specification.

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4.4 BATHROOM VANITY - INTEGRAL BASIN
Refer architectural finishes and fixtures schedule for selections and specification.

4.5 BATHROOM VANITY - BASIN MIXER
Refer architectural finishes and fixtures schedule for selections and specification.

Shower Fixtures

4.6 SHOWER ENCLOSURE
Not applicable - tile shower.

4.7 SLIDE SHOWER AND MIXER
Refer architectural finishes and fixtures schedule for selections and specification.

Bath Fixtures

4.8 BATH
Not applicable

4.9 BATH TAP & MIXER
Not applicable

Kitchen Fixtures

4.10 KITCHEN SINK
Refer architectural finishes and fixtures schedule for selections and specification.

4.11 KITCHEN SINK MIXER
Refer architectural finishes and fixtures schedule for selections and specification.

Laundry Fixtures

4.12 LAUNDRY TUB
Refer architectural finishes and fixtures schedule for selections and specification.

4.13 LAUNDRY MIXER
Refer architectural finishes and fixtures schedule for selections and specification.

Additional Fixtures

4.14 BATHROOM MIRROR
Refer architectural finishes and fixtures schedule for selections and specification.

4.15 EXTERNAL TAPS
As required, typically 2x.

Accessories

4.16 HEATED TOWEL RAIL
Refer architectural finishes and fixtures schedule for selections and specification.

4.17 ACCESSORIES - ROLL HOLDER
Refer architectural finishes and fixtures schedule for selections and specification.

4.18 ACCESSORIES - HAND TOWEL RING
Refer architectural finishes and fixtures schedule for selections and specification.

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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 7701 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

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

refer to 1237WA WARRANTY AGREEMENT

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 QUALIFICATIONS - ELECTRICAL WORK

Electrical work to be carried out by workers appropriately qualified to Electricity (Safety) Regulations 2010 requirements, and to be inspected, tested and certified by a licensed electrical worker. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 TYPE 1 DOMESTIC SMOKE ALARM SYSTEM

Comply with NZBC C/AS1 providing Type 1 domestic smoke alarm system to NZS 4514.

1.8 NO SUBSTITUTION

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 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 ACCESSIBLE HUSH-BUTTON

Hush-button to manufacturer's requirements located at readily accessible location, i.e. a hallway. Refer to SELECTIONS.

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2.5 CABLES

Tough plastic sheathed copper wire cable to AS/NZS 5000.2, AS/NZS 3808 and AS/NZS 1125. Minimum 1mm² solid cable for 230VAC mains powered alarm devices and minimum 0.5mm² stranded cable for extra-low voltage (less than 32VAC or 50VDC) powered alarm devices to NZS 4514.

2.6 INTERNAL BATTERY - HARD WIRED ALARMS

To NZS 4514, Power Supplies. Batteries contained within alarm device to be of type nominated by the smoke alarm manufacturer and if inaccessible to be rechargeable.

2.7 EXTERNAL BATTERY - HARD WIRED ALARMS

To NZS 4514, Power Supplies. Batteries external to alarm device to comply with NZS 4512 or AS/NZS 2201.1 where alarm devices are integrated in intruder alarm systems.

2.8 SEALED BATTERY - WIRELESS ALARMS

To NZS 4514, Power Supplies. Long-life (minimum 10 years), non-removable, sealed batteries.

2.9 SENSORY STIMULATING ALARM DEVICES

Sensory stimulating alarm devices such as visual or vibrating alerting devices to AS 1603.17 and BS 5446.3. 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.

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.

3.8 POWER SUPPLY

Connect hard wired alarms to either permanently energised 230VAC mains fed from permanently energised (unswitched) circuit i.e. lighting or to external direct current (DC) power supply maintained from 230VAC mains to NZS 4514, Power Supplies.

Installation - smoke alarm system

3.9 INSTALL CABLES

Install smoke alarm system's hard wiring to AS/NZS 3000, NZS 4514 and manufacturer's instructions.

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3.10 INSTALL BATTERIES

Install primary and secondary batteries to NZS 4514 and manufacturer's instructions. Indelibly mark batteries with the date of installation.

3.11 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.

3.12 INSTALL SENSORY STIMULATING ALARM DEVICES

Install sensory stimulating alarm devices to manufacturer's instructions and to comply with AS 1603.17 and BS 5446.3.

3.13 INSTALL ACCESSIBLE HUSH-BUTTON

Install accessible hush-button to manufacturer's instructions fitted neatly and without damage to the surrounding finish using brackets and mounts supplied or recommended by the manufacturer.

3.14 INTERCONNECT

Interconnect devices so that when one activates all alarms sound.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

3.16 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

4 SELECTIONS

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

Alarm devices

4.1 MULTI-SENSOR SMOKE ALARM

Location:	Refer to drawings
Brand:	Client approved Selection.
Type:	Multi-sensor smoke alarm
Sensor:	Photoelectric smoke & heat sensor
System:	Wireless, or Hard wired
Compliance:	NZS4514 requires for smoke alarms to comply with at least one of the following standards: AS3786, BE EN 14604, CAN/ULC S531, ISO 12239, or UL 217

4.2 HEAT ALARM

Location:	Refer to drawings
Brand:	Client approved selection.
Type:	Heat alarm
Sensor:	Fixed heat sensor, or Rise in temperature sensor
System:	Wireless, or Hard wired

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7411D METAL RAINWATER SPOUTING SYSTEMS

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.2 DOCUMENTS

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

NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Dimond, Roofing and Cladding Systems Design Manual, (web based Manual with dated update pages)

Manufacturer/supplier contact details

Company:	Fletcher Steel Ltd
Trading as:	Dimond Roofing
Web:	www.dimond.co.nz
Email:	roofspec@dimond.co.nz
Telephone:	0800 346 663 (0800 DIMOND)

Warranties

1.4 WARRANTY

Warrant this work under normal environmental and use conditions against:

Failure of coating adhesion: 5 year manufacturer's standard warranty
Weatherproofing by material penetration: 5 year manufacturer's standard warranty
Weatherproofing by substandard workmanship: 3 years
From: Date of completion of installation

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

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

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

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Performance

1.8 TEST

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

2 PRODUCTS

Materials

2.1 SPOUTING

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

2.2 DOWNPIPES

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

Components

2.3 DROPPERS

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

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

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

3.2 SUBSTRATE

Check that fascia, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are suitable to fix to standard.

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

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

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

Application - metal

3.5 INSTALL METAL SPOUTING

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

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3.6 INSTALL METAL DOWNPIPES

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

Completion

3.7 REPLACE

Replace damaged or marked elements.

3.8 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.9 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 METAL GUTTER

Profile:	Taylor 125mm Box Gutter
Size:	Refer drawings
Base material:	Steel
BMT:	0.55mm
Coating system:	Colorsteel Maxam
Dimond colour:	Refer colour schedules - architectural drawings.

4.2 METAL FASCIA

Profile:	Taylor 185mm Fascia
Size:	185mm
Base material:	Steel
BMT:	0.55mm
Coating system:	Colorsteel Maxam
Dimond colour:	Refer colour schedules - architectural drawings.

4.3 METAL DOWNPIPE

Profile:	Round
Size:	80dia
Base material:	Steel
BMT:	0.55mm
Coating system:	Colorsteel Maxam
Dimond colour:	Refer colour schedules - architectural drawings.

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7421 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures.

Refer to 7123 HOT AND COLD WATER SYSTEM for potable water systems.
Refer to 7431 DRAINAGE COMMON REQUIREMENTS for underground drains.
Refer to 7142 GREYWATER SYSTEMS for greywater systems.

1.2 SPECIAL REQUIREMENTS

Contractor must ensure, and demonstrate with appropriate documentation, that all Selections shown in Section 4 meet the performance standards described and implied in Section 2 (PRODUCTS), unless a specific brand has been included, in which case refer to Section 1234 regarding Substitutions

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 G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 1589	Copper and copper alloy waste fittings
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4401	Plastic piping systems for soil and waste discharge (low and high temperature) inside buildings - polyethylene (PE)
AS/NZS 7671	Plastic piping systems for soil and waste discharge (low and high temperature) inside buildings - Polypropylene (PP)
BS EN 1124 .1	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. Requirements, testing, quality control.
BS EN 1124 .2	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. System S, forms and dimensions.

Plumbers, Gasfitters and Drainlayers Act 2006

Requirements

1.4 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.

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1.5 PIPEWORK LAYOUTS

Refer to Sheet 7450 Plumbing and Drainage Schematics

1.6 OPERATION AND MAINTENANCE MANUALS

Supply maintenance manual information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

Performance

1.7 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

2 PRODUCTS

Materials

2.1 COPPER PIPES AND TRAPS

To NZS 3501 for pipes and AS1589 for fittings.

Pipes complete with copper-alloy compression fittings and/or crox type joints and seal ring compression joints. Traps complete with screwed access ports. Exposed traps and wastes, complete with matching ferrules at penetration location, satin chrome plated.

2.2 PVC-U WASTE PIPES AND TRAPS

To AS/NZS 1260, complete with fittings and accessories to the pipe manufacturer's requirements, all brand matched.

2.3 PVC-U VENT PIPE

To AS/NZS 1260, complete with fittings and accessories to the pipe manufacturer's requirements and all brand matched.

2.4 STAINLESS STEEL PIPES & FITTINGS

Stainless Steel pipe and fittings to BS EN 1124.1 and BS EN 1124.2.

2.5 POLYETHYLENE PIPES & FITTINGS

Polyethylene PE pipes and associated fittings to AS/NZS 4401.

2.6 POLYPROPYLENE PIPES & FITTINGS

Polypropylene pipe and associated fittings to AS/NZS 7671.

2.7 EXPOSED PLASTIC PIPES AND TRAPS

Plastic traps and fittings to AS 2887.

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for locations and types of traps.

2.8 CHROME EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings, or chromed plastic.

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for locations and types of traps.

2.9 FLOOR WASTES

Floor wastes and floor waste gullies to AS/NZS 3500.2, complete with chrome grates to suit flooring.

2.10 GREASE TRAP - PROPRIETARY

Proprietary grease trap, refer to SELECTIONS.

Components

2.11 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.



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Accessories

2.12 FIRE RESISTANT SEALER

Gunnable inorganic or silicone elastomer sealant packed to maintain the specified fire resistance rating of the floor or wall.

2.13 FIRE RESISTANT FOAM SEALER

Two-part silicone foam elastomer sealant packed to maintain the specified fire resistance rating of the floor or wall.

2.14 FIRE RESISTANT STRIP

Intumescent material mounted on a flexible retardant strip used in conjunction with the selected sealer.

2.15 FIRE RESISTANT COLLARS

Corrosion resistant collar or canister with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

2.16 FIRE RESISTANT PANELS

Moulded mineral fibre refractory panels supported in the opening as necessary by light gauge corrosion-resistant steel frame and mullions.

3 EXECUTION

Conditions

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 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.3 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.4 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.

3.5 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site under cover on a clean level area, stacked to eliminate movement and away from work in progress.

3.6 SETTING OUT

Set out location of all stacks, discharge pipes, fittings and vent pipes and the completeness of their discharge into the drainage system.

3.7 CORE HOLES AND SLEEVES

Fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Sleeve diameter to be 25mm larger than outside diameter of pipe accommodated. Strip core holes and make good after installation of pipework.

3.8 PIPE ACCESS

Fit and fix stacks, wastes and pipes in ducts independent of all other services so they are easily replaceable for their full length. Wrap or tape pipes buried in concrete.

3.9 FITTINGS ACCESS

Fit and fix traps and wastes to enable access for cleaning and for maintaining the total system.

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3.10 CONFIRM LOCATIONS

Unless the location and height are clearly delineated on the drawings, confirm installation height and plan locations of sanitary fittings before commencing the piping installation.

3.11 TRAPS AND WASTES

Conceal traps and wastes in the fabric of the building unless detailed otherwise. Fit and fix satin chrome plated exposed pipes, traps and wastes unless detailed otherwise.

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for locations and types of traps.

3.12 CORROSION

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

Application - jointing

3.13 JOINTING COPPER PIPE - NZBC G13/AS1

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G13/AS1.

3.14 JOINTING COPPER PIPE - AS/NZS 3500.2

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to AS/NZS 3500.2, section 2.8 Joints.

3.15 JOINTING PVC-U PIPE

Prime and solvent weld joints using spigots and sockets, flanged joints and seal ring compression joints to AS/NZS 2032.

Application - fixing

3.16 THERMAL MOVEMENT

Accommodate longitudinal movement in pipes resulting from temperature changes. Incorporate expansion joints in copper and PVC-U pipes. Install PVC pipes to AS/NZS 2032. Take particular care to allow for movement at horizontal take-off locations from stacks.

3.17 TRAPS AND FIXTURE DISCHARGE PIPES - NZBC G13/AS1

Size traps and pipes as required for each fixture or appliance. Establish the developed length of waste pipes. Vent and allow access for cleaning as required. Follow the most direct line with the least number of bends to NZBC G13/AS1: Foul water sanitary plumbing, table 4, Discharge unit loading for stacks and graded discharge pipes and NZBC G13/AS1, table 7, Distance between supports.

3.18 TRAPS AND FIXTURE DISCHARGE PIPES - AS/NZS 3500.2

Size traps and pipes as required for each fixture or appliance. Establish the developed length of waste pipes. Vent and allow access for cleaning as required. Follow the most direct line with the least number of bends to AS/NZS 3500.2, table 3.3.1, for fixture loading and AS/NZS 3500.2, table 10.2.1, distance between supports.

3.19 DISCHARGE STACKS AND VENTS - NZBC G13/AS1

Size stacks and vents to NZBC G13/AS1, table 2, Fixture discharge pipe sizes and discharge units and NZBC G13/AS1, table 6, Vent pipe sizes. Extend up past the highest branch to form a discharge stack vent terminating to NZBC G13/AS1, figure 12 and finishing at the base with a 45 degree bend. Support system to NZBC G13/AS1, table 7, Distances between supports.

3.20 DISCHARGE STACKS AND VENTS - AS/NZS 3500.2

Size stacks and vents to AS/NZS 3500.2, table 6.3(A), for fixture discharge pipe sizes and discharge units and AS/NZS 3500.2, table 3.9.3.1, vent pipe sizes. Extend up past the highest branch to form a discharge stack vent terminating to AS/NZS 3500.2, section 6.9 Vents, and finishing at the base with a 45 degree bend. Support system to AS/NZS 3500.2, table 10.2.1, for distances between supports.

3.21 FLASH ROOF PENETRATIONS

Flash or arrange for roofer to flash all penetrations to NZBC E2/AS1.

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For profiled metal roofs, fit proprietary EPDM pipe collar flashings to NZBC E2/AS1, 8.4.17 Roof Penetrations, and manufacturer's requirements.

Application - pipework for waterless urinals

3.22 URINAL DISCHARGE PIPES - NZBC G13/AS1

Size PVC-U pipes as required for each urinal. Establish developed length of waste pipes, vent as required, and allow access for cleaning. Follow the most direct line with the least number of bends to NZBC G13/AS1, table 4, Discharge unit loading for stacks and graded discharge pipes and NZBC G13/AS1, table 7, Distances between supports.

Note: Do not connect to copper or brass, pipes and fittings.

3.23 URINAL DISCHARGE PIPES - AS/NZS 3500.2

Size PVC-U pipes as required for each urinal. Establish developed length of waste pipes, vent as required, and allow access for cleaning. Follow the most direct line with the least number of bends to AS/NZS 3500.2, table 3.3.1, fixture loading and AS/NZS 3500.2, table 10.2.1, for distances between supports.

Note: Do not connect to copper or brass, pipes and fittings.

Application - fire resistant penetrations

3.24 FIRE RESISTANT SEALER

Thoroughly clean the penetration of the floor or wall. Pack if necessary to support sealant. Implant sealant to the sealant manufacturer's requirements to ensure full penetration and to obtain the fire resistance rating required. Tool surface flush and smooth and allow to cure. Inspect for and make good if adhesion and seal are not complete.

3.25 FIRE RESISTANT FOAM SEALER

Thoroughly clean opening and box each side with fibreboard to contain the sealer. Mix sealer and inject into opening to the volume and time limits in the sealer manufacturer requirements to obtain the fire resistance rating required. Allow to cure, remove boxing and make good voids with sealer.

3.26 FIRE RESISTANT STRIP

Wrap around the pipe and tape in place in the hole, caulking each side with fire resistant sealer. Tool the surface flush and smooth and allow to cure. Inspect for and make good if adhesion and seal are not complete.

3.27 FIRE RESISTANT COLLARS

Insert circular type collars into holes provided in the concrete. Supply canister type collars. Locate and fix to the boxing before concrete is placed. Comply with the collar manufacturer's requirements for use of these elements, complete with accessories, tapes and sealants required for each particular situation.

3.28 FIRE RESISTANT PANELS

Secure steel frames or mullions within the openings to panel manufacturer's details. Cut panels to suit the opening and the services and fit neatly and flush with the required maximum clearances. Seal round panels and services with fire resistant foam sealer, to maintain the fire resistance rating of the floor or wall.

Completion

3.29 REPLACE

Replace damaged or marked elements.

3.30 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

3.31 REMOVE

Remove debris, unused materials and elements from site.

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4 SELECTIONS

4.1 SANITARY SYSTEMS - COPPER PIPES AND TRAPS

Location: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.2 SANITARY SYSTEMS - PVC-U WASTE PIPES AND TRAPS

Location: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.3 SANITARY SYSTEMS - PVC-U VENT PIPE

Manufacturer: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.4 SANITARY SYSTEMS - STAINLESS STEEL PIPES AND FITTINGS

Location: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.5 SANITARY SYSTEMS - POLYETHYLENE PIPES & FITTINGS

Location: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.6 SANITARY SYSTEMS - POLYPROPYLENE PIPES & FITTINGS

Location: Refer to drawings
Selection: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.7 SANITARY SYSTEMS - FLOOR WASTES

Type: Refer to relevant section

4.8 SANITARY SYSTEMS - PROTECTIVE TAPE

Width: Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

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7421AI ALLPROOF INTERIOR FLOOR WASTE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** interior floor waste systems suitable for residential and commercial applications.
It includes:

- Vision series shower channel kit
- Tile waste kit
- Vinyl waste kit
- Cyclone waste kit
- Easy clean trap floor waste kit
- Revolver waste kit
- Flange and grate system (flange and grate combo only, not a full kit)
- Grate, flange and floor waste gully components necessary to complete the installation

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures.

Refer to 7420 and 7421 SANITARY SYSTEMS for above ground gravity flow sanitary systems

Documents

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/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allproof Industries interior floor waste system brochures
Allproof Industries interior floor waste system technical details
Allproof Industries interior floor waste system installation guide.

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5-50 years	For Allproof Industries interior floor waste system components. For warranty conditions and details refer to Allproof Industries.

- Provide this warranty on Allproof Industries Ltd standard form
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

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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 PIPEWORK LAYOUTS

Refer drawings.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

Compliance information

1.9 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 Certificate of Conformance
- Installer's warranty
- Producer Statement - Construction from the installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.10 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

2 PRODUCTS

Materials - Allproof floor waste kit systems

2.1 VISION SERIES SHOWER CHANNEL KIT

Allproof Vision series shower channel kit comprised of the following:

- Stainless steel grate and channel with a central outlet
- VF80 leak control flange
- 80mm x 50mm Floor waste gully standard, 80mm x 65mm available
- Channels available in 4 stock lengths, 5 grate options, and custom colour powder coating options.
- Customized lengths and outlet locations available

Refer to SELECTIONS for options.

Components - flanges

2.2 LEAK CONTROL FLANGE

Allproof Leak Control Flange with features as follows:

- PVC leak control flange to suit 50mm to 100mm pipe sizes
- Construction cap available
- Flange has locating lugs for floor waste grate, allowing sub-tile moisture to escape through DWV pipe system
- Outlet range includes 50mm, 50mm/90°outlet, 65mm, 80mm and 100mm pipe size
- Grates - 18 options available

Refer to SELECTIONS for options.

2.3 TILERITE

Allproof Tilerite PVC floor waste flange with features as follows:

- Base flange fits inside 80mm and 100mm pipe riser



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- Threaded clamp ring and cyclone spigot
- Vinyl / waterproofing membrane clamped using 3 x stainless steel screws and clamp ring
- Height adjustable grate with threaded spigot
- Grates - square and round options
- Product options - 80mm and 100mm pipe sizes

Refer to SELECTIONS for options.

Component - floor waste gully

2.4 FLOOR WASTE GULLY

Allproof Floor Waste Gully with features as follows:

- Injection moulded PVC floor waste gullys / traps
- Product options - 80x50mm, 80x65mm, 100x50mm and 100x65mm

Refer to SELECTIONS for options.

3 EXECUTION

Conditions

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 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site under cover on a clean level area, stacked to eliminate movement and away from work in progress.

3.4 SETTING OUT

Set out location of all fittings and vent pipes and the completeness of their discharge into the drainage system.

3.5 CORE HOLES AND SLEEVES

Fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Sleeve diameter to be 25mm larger than outside diameter of pipe accommodated when installed in the foundation, Allproof Pipe Sleeve to be used through other penetrations. Strip core holes and make good after installation of pipework.

3.6 PIPE ACCESS

Fit and fix wastes and pipes in ducts independent of all other services so they are easily replaceable for their full length. Wrap or tape pipes buried in concrete.

3.7 FITTINGS ACCESS

Fit and fix traps and wastes to enable access for cleaning and for maintaining the total system.

3.8 CONFIRM LOCATION

Unless the location and height are clearly delineated on the drawings, confirm installation height and plan locations of sanitary fittings before commencing the piping installation.

3.9 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.

Installation - generally

3.10 INSTALLATION - WATERPROOFING MEMBRANES

Refer to relevant waterproofing membrane section(s) for installation of membranes and associated sub-trades.

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Installation - Allproof floor waste kit systems

3.11 INSTALL FLOOR WASTE KIT SYSTEMS

Install floor waste kit systems in accordance with Allproof interior floor waste system brochure and installation guide.

Installation - components

3.12 INSTALL GRATE, FLANGE AND FLOOR WASTE GULLY COMPONENTS

Install grate, flange and floor waste gully components in accordance with Allproof interior floor waste system brochure and installation guide.

Completion

3.13 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused materials and elements from the site.

3.14 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable.

Commissioning

3.15 TESTING

Pre-test all waste pipe during construction. On completion of the work and before approval for acceptance of the pipework, carry out a final test to the approval of the engineer and if required witnessed by the representative of the territorial authority.

4 SELECTIONS

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

Materials - Allproof floor waste kit systems

4.1 ALLPROOF VISION SERIES SHOWER CHANNEL KIT

Location:	Bathrooms
Manufacturer:	Allproof Industries
Channel size:	80mm wide x length of shower mm long
Channel finish:	Stainless steel
Grate:	Tile Insert
Flange type:	VF80 leak control flange
Floor waste gully:	80x50mm standard, 80x65mm also available
Product code:	Refer to Allproof Industries interior floor waste system brochure and technical details

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7461 FOUL WATER DRAINAGE

1 GENERAL

This section relates to below ground, non-pressure foul water pipework complete with all maintenance access and fittings and connected to network utility operator sewers.

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7421 SANITARY SYSTEMS for above ground pipework
Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7451 SURFACE WATER DRAINAGE for storm/surface water drainage

Documents

1.2 DOCUMENTS

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

NZBC G13/AS2	Foul water - Drainage
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4058	Precast concrete pipe (pressure & non pressure)
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
BS EN 1124 .1	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. Requirements, testing, quality control.
BS EN 1124 .2	Pipes and fitting of longitudinally welded stainless steel pipes with spigot and socket for waste water systems. System S, forms and dimensions.

Performance

1.3 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS2,6.1 Testing or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

2 PRODUCTS

Materials

2.1 REINFORCING STEEL

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

2.2 CONCRETE PIPES

Precast concrete to AS/NZS 4058.

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2.3 STEEL PIPES AND FITTINGS

Welded steel pipes and fittings to NZS 4442.

2.4 PVC-U PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to AS/NZS 1260, buried pipes classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.5 POLYETHYLENE PIPES AND FITTINGS

Polyethylene pipe and fittings to AS/NZS 5065.

2.6 STAINLESS STEEL PIPES AND FITTINGS

Stainless Steel pipe and fittings to BS EN 1124.1 and BS EN 1124.2.

2.7 GULLY TRAPS - NZBC G13/AS2

Gully traps complete with grating to NZBC G13/AS2, 3.3 Gully traps.

2.8 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

2.9 GREASE TRAPS - PRE-CAST

Grease trap, complete with strainer and cast-iron access lid, to NZBC G13/AS2, 3.4 Grease traps.

2.10 GREASE TRAPS - PROPRIETARY

Proprietary grease trap, refer to SELECTIONS.

2.11 INSPECTION CHAMBERS - NZBC G13/AS2

Circular precast concrete or plastic to NZBC G13/AS2, 5.7 Access points, complete with cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

2.12 INSPECTION OPENINGS & SMALL CHAMBERS - AS/NZS 3500.2

Circular precast concrete or plastic to AS/NZS 3500.2, 4.7 Inspection Openings and/or 4.8 Inspection Chambers, as modified by NZBC G13/AS3, complete with cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

2.13 ACCESS CHAMBERS - NZBC G13/AS2

Circular precast to NZBC G13/AS2, 5.7 **Access points**, complete with lift up cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

2.14 LARGE INSPECTION CHAMBERS OR ACCESS CHAMBERS - AS/NZS 3500.2

Circular precast to AS/NZS 3500.2, 4.8 Inspection Chambers, as modified by NZBC G13/AS3, complete with lift up cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

Accessories

2.15 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2

Bedding and backfilling material to NZBC G13/AS2, 2.0 Materials, or methods shown in NZBC G13/AS2, figure 7, Bedding and backfilling.

2.16 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding and backfilling material to AS/NZS 3500.2, 5.4, Bedding of drains, and for concrete, if required, AS/NZS 3500.2, 5.3 Concrete Support.

2.17 CONCRETE

To NZS 3104.

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Prescribed mix 17.5 MPa:	For in situ bases, anchors and pipe surrounds.
Prescribed mix 14 MPa:	For bedding only.

3 EXECUTION

Conditions

3.1 EXECUTION GENERALLY - NZBC G13/AS2

Carry out this work to NZBC G13/AS2 and NZBC G1/AS1 and complete all tests to G13/AS2, 6.1 Testing.

3.2 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2 as modified by NZBC G13/AS3 and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.3 EXISTING DRAINS - NZBC G13/AS2

Completely remove any existing drains no longer required and disconnect from the system at the junction with the live drain. Seal the live drain to the requirements of NZBC G13/AS2, 5.10 Disused drains.

3.4 EXISTING DRAINS - AS/NZS 3500.2

Completely remove any existing drains no longer required and disconnect from the system at the junction with the live drain. Seal the live drain to the requirements of AS/NZS 3500.2, 10.9 Disconnection of Sanitary Plumbing, as modified by NZBC G13/AS3.

Bedding, backfilling and encasement

3.5 TRENCH BACKFILLING GENERALLY - FOUL & SURFACE WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.6 FOUL WATER TRENCH BACKFILLING - NZBC G13/AS2

Carry out foul water trench backfilling to NZBC G13/AS2, 5.3 to 5.5 and fig 7.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.7 FOUL WATER TRENCH BACKFILLING - AS/NZS 3500.2

Carry out foul water trench backfilling to AS/NZS 3500.2, 5.1, 5.2 and 5.5 as modified by NZBC G13/AS3.

UPVC pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.8 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.

Application

3.9 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

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3.10 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid. Install PVC-U pipes to AS/NZS 2032 or AS/NZS 2566.1 and AS/NZS 2566.2. Install polyethylene Pipes to AS/NZS 2033. Cap ends of uncompleted runs each day to prevent entry of foreign matter. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to drains with less than 375mm cover.

3.11 LAYING FOUL WATER DRAINS

Lay the drainage system from soil stacks and gully traps, including access chambers, inspection chambers, bends, junction inspections, and vents (fresh air inlets). Discharge into the network utility operator foul water system to their requirements.

3.12 DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

Application - fittings

3.13 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to NZBC G13/AS2, 3.3 Gully traps.

3.14 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to AS/NZS 3500.2, 4.6,Gullies.

3.15 CONSTRUCT ACCESS CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing using precast concrete units and a removable cast iron cover, to NZBC G13/AS2, 5.7 Access points. Provide all necessary haunching to channels.

3.16 CONSTRUCT LARGE INSPECTION/ACCESS CHAMBERS - AS/NZS 3500.2

Construct as detailed on a poured concrete footing using precast concrete units and a removable cast iron cover, to AS/NZS 3500.2, 4.8 Inspection chambers. as modified by NZBC G13/AS3. Provide all necessary haunching to channels.

3.17 CONSTRUCT 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.

3.18 CONSTRUCT SMALL INSPECTION CHAMBERS - AS/NZS 3500.2

Construct as detailed on a poured concrete footing to AS/NZS 3500.2, 4.7 Inspection openings and 4.8 Inspection chambers, as modified by NZBC G13/AS3. Provide all necessary haunching to channels.

3.19 CONSTRUCT GREASE TRAP

Construct with a poured concrete footing and surround using precast concrete units, removable steel strainer and a removable cast iron cover, to NZBC G13/AS2: Foul water drainage, 3.4 Grease traps.

3.20 BED PRECAST GREASE TRAP

Bed in concrete and fit precast concrete grease trap and lid to the trap manufacturer's requirements.

3.21 PROPRIETARY GREASE TRAP

Install grease trap to the manufacturer's requirements

Application - connections

3.22 CONNECTION TO FOUL WATER - PUBLIC MAINS

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

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3.23 CONNECTION TO FOUL WATER - PUBLIC MAINS ACCESS CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

3.24 CONNECTION TO FOUL WATER - ON SITE

Locate, excavate and expose the existing drain, connect new pipework to existing drain using a 'Y' junction, to meet the standards of the new work.

3.25 CONNECT TO ON-SITE TREATMENT SYSTEM

Connect to on-site waste water treatment system. Refer to 7462 WASTE WATER TREATMENT SYSTEM.

4 SELECTIONS

4.1 OVERFLOW RELIEF GULLY

Manufacturer:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.2 INSPECTION CHAMBERS - NZBC G13/AS2

Diameter:	Refer to Civil Engineers Drawings
Type:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.3 INSPECTION OPENINGS & SMALL CHAMBERS - AS/NZS 3500.2

Diameter:	Refer to Civil Engineers Drawings
Type:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.4 ACCESS CHAMBERS - NZBC G13/AS2

Diameter:	Refer to Civil Engineers Drawings
Type:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.5 LARGE INSPECTION OR ACCESS CHAMBERS - AS/NZS 3500.2

Diameter:	Refer to Civil Engineers Drawings
Type:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS"

4.6 AIR ADMITTANCE VALVE - AS/NZS 3500.2

Type:	Client Approved Contractually Nominated Selection, to the minimum standard listed on Section 2 "PRODUCTS" Contractors choice, in accordance with AS/NZS 3500.2
Airflow:	The Minimum determined airflow capacity of AAV's when used as a trap vent, group vent or branch drain vent must comply with AS/NZS 3500.2 Table 6.10.2(A). The Minimum determined airflow capacity of AAV's venting discharge stacks must comply with AS/NZS 3500.2 Table 6.10.2(B)
Note:	AAV's must only be used on sanitary plumbing waste systems that have at least one open DN50 minimum vent connected to the drain.

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7556 SOLID FUEL SPACE HEATING SYSTEM

1 GENERAL

This section relates to the supply and installation of domestic, solid fuel burner appliances for space heating.

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:

NES	Resource Management (National Environmental Standards for Air Quality) Regulations 2004
ECAN	Environment Canterbury
CM1	ECAN Canterbury Method 1 for testing of ultra-low emission wood burners
NCC	Nelson City Council
NZHHA	New Zealand Home Heating Association
SFAIT	Solid Fuel Appliance Installation Technician

The following definitions apply specifically to this section:

Open fire	Traditional type of fire, prefabricated or insitu, with one side (or more) open and no or little air flow control
Open fire with glass front	Similar to the open fire, usually prefabricated, but with a glass front(door) and some air flow control. May or may not be tested (to AS/NZS 4012 & AS/NZS 4013 - emissions ≤ 1.5 g/kg, efficiency ≥ 65%)
Solid fuel burner (NES)	Purpose made, prefabricated, fully enclosed with airflow control (& possibly other features). Tested to demonstrate compliance with the NES standards (to AS/NZS 4012 & AS/NZS 4013, emissions ≤ 1.5 g/kg, efficiency ≥ 65%)
Solid fuel burner (non-compliant)	May be multi-fuel and may have two air flow controls. Can be banked down overnight. Will not be tested
Solid fuel burner, low emission (LEB)*	Generally has only one air flow control. Can not be banked down overnight. Tested to AS/NZS 4012 & AS/NZS 4013 with emissions ≤ 1 g/kg, efficiency ≥ 65%. (Note: NES emissions ≤ 1.5 g/kg)
Solid fuel burner, ultra-low emission (ULEB)*	Tested to the Canterbury Method 1 (CM1), emissions and efficiency standard ≤ 38 mg/MJ of useful energy and a thermal efficiency of ≥ 65%
Exterior fire	An appliance with cooking facilities, and intended to be installed in a fireplace or a suitably flued enclosure outdoors.

* ECAN classification

Documents

1.2 DOCUMENTS

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

NZBC B1/AS3	Small chimneys
NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS/NZS 2918:2001	Domestic solid fuel burning appliances - Installation
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 3869	Domestic solid fuel burning appliances - Design and construction

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AS/NZS 4012	Domestic solid fuel burning appliances - Method for determination of power output and efficiency
AS/NZS 4013	Domestic solid fuel burning appliances - Method for determination of flue gas emission

Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (NES)
Plumbers, Gasfitters and Drainlayers Act 2006
ECAN Canterbury Method 1 for testing of ultra-low emission wood burners (CM1)

1.3 MANUFACTURER'S DOCUMENTS

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

Refer Metro Fires

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide the manufacturer's warranty for the supply of materials and proprietary products, to the project administrator.

2 years:	For the supply of fire place

Provide this warranty in the approved manufacturer's standard form.
Warranty to commence from the date of completion of the installation.

1.5 WARRANTY - INSTALLER

Provide the installer's warranty for the installation, to the project administrator.

2 years	For installation of fireplace/burner, flue kit and accessories

Provide this warranty in the approved installer's standard form.
Warranty to commence from the date of completion of the installation.

Requirements

1.6 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS

Work to be carried out by the manufacturer's accredited trades people registered with the NZHHA or certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006, competent and familiar with the materials and techniques specified.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

All fire place docs.

Provide this information prior to practical completion.

Performance

1.9 COMPLIANCE WITH STANDARDS

Solid fuel-burning appliances installed to AS/NZS 2918. Where required by the regulatory authority, the appliance is to comply with the requirements of AS/NZS 4012 and AS/NZS 4013 or CM1, and be fitted with a compliance plate marked 'Tested to AS/NZS 4012 and AS/NZS 4013' or 'Tested to CM1'.

1.10 DURABILITY

Solid fuel-burning appliances to be installed to comply with NZBC B2/AS1 Table C.1.1.1.

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1.11 FINAL INSPECTION AND TEST

Undertake final tests to show the installation complies with AS/NZS 2918 and AS/NZS 4013, and has been tested for leakage and proved to be fully operational.

Carry out testing at the time of completion of installation. Test and demonstrate the system according to manufacturer's specification.

1.12 PRODUCER STATEMENT - INSTALLATION

Provide a producer statement by the installer in the form as required by the Building Consent Authority. The Producer Statement must verify that the design complies with AS/NZS 2918 Domestic solid fuel burning appliances - Installation, naming the installer and the person responsible for verification of the installation and for the post installation tests.

2 PRODUCTS

Indoor Fires

2.1 FREESTANDING SOLID FUEL LOW EMISSION BURNER (LEB)

LEB to ECAN definition. Solid fuel appliance comprising of a free standing base, firebox, firebricks, door, outer casing to firebox with hearth; and complete with stainless steel flue, flue shield, outer shield, ceiling plate, flashing and weather cowl.

Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction, tested to AS/NZS 4012 and AS/NZS 4013 (emissions ≤ 1 g/kg, efficiency ≥ 65%), and installed to AS/NZS 2918.

2.2 FREESTANDING SOLID FUEL ULTRA-LOW EMISSION BURNER (ULEB)

ULEB to ECAN definition. Solid fuel appliance comprising of a free standing base, firebox, firebricks, door, outer casing to firebox with hearth; and complete with stainless steel flue, flue shield, outer shield, ceiling plate, flashing and weather cowl.

Options may include ceiling sleeve, wetback, floor protector, safety screen and decorative frame - refer to SELECTIONS.

Designed and manufactured to AS/NZS 3869 Domestic solid fuel burning appliances - Design and construction, tested to AS/NZS 4012, AS/NZS 4013 and CM1 (emissions ≤ 38 mg/MJ of useful energy, efficiency ≥ 65%), and installed to AS/NZS 2918.

Components & Accessories

2.3 FLUE SYSTEM

All seams in the stainless steel flue pipe to be lock-folded or continuously welded to AS/NZS 2918. Joints between sections of flue pipe to be push fitted with the upper section entering the lower section and secured with 3 fasteners to prevent accidental separation. For vitreous enamelled flue pipe sections within a room, these may be joined without fasteners using a series or overlapping sections having a minimum overlap of 50 mm.

Flue systems beyond the wall or ceiling penetrations to be provided with either a double casing or a tested single casing to AS/NZS 2918. Flue pipe casings fabricated from copper or brass to have at least a 25 mm minimum air gap from the flue pipe.

2.4 FLOOR PROTECTOR

Conforming to AS/NZS 2918.

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3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 PRE-INSTALLATION / APPLICATION REQUIREMENTS

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

Installation

3.3 STANDARDS AND TOLERANCES

Refer to the general section CONSTRUCTION for general requirements.

Refer to the MANUFACTURER'S DOCUMENTS for product-specific requirements and tolerances.

3.4 INSTALLATION

Install the heater and flue to AS/NZS 2918 and NZBC E2/AS1. Refer to the manufacturer's installation instructions for specific model details. For free standing appliances, bolt base down securely to floor to manufacturer's specifications. Commission unit to ensure installation complies with the manufacturer's specifications. External requirements to AS/NZS 2918.

3.5 FLOOR PROTECTOR

Install a floor protector to AS/NZS 2918. Refer to the manufacturer's installation instructions for proprietary floor protectors.

Completion & Commissioning

3.6 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.7 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

3.8 PROTECTION

Provide the following temporary protection of the finished work:

3.9 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and commissioning requirements.

Loose items to be stored securely, or as arranged with owner (particularly for outdoor fires).
Include the following checks:

4 SELECTIONS

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

Indoor Fires

4.1 FREESTANDING SOLID FUEL LOW EMISSION BURNER (LEB)

Metro Fires Wee Woody.

Components & Accessories

4.2 FLUE KIT

Manufacturer:	Metro Fires
Material:	316 stainless steel
Thickness:	0.52 mm

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4.3 CHIMNEY FLUE FLASHING AND CAP

4.4 FLOOR PROTECTOR



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7612 RESIDENTIAL EXTRACT SYSTEMS

1 GENERAL

This section relates to the supply and installation of extract systems for residential applications. It includes:

- Kitchen extract systems
- Bathroom and laundry extract systems

Documents

1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC G4/AS1	Ventilation of buildings
NZBC G9/VM1	Electricity

Electricity (Safety) Regulations 2010

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier 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.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 ELECTRICAL QUALIFICATION

Registered electrician to carry out work to Electricity (Safety) Regulations 2010.

1.7 NO SUBSTITUTIONS

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1234 DOCUMENTATION for provision of the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

1.9 EXTRACT FLOW RATES

To NZBC G4/AS1.

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Extract fans (including associated ducts) to have a minimum flow rate of:

- 25 L/s for showers and baths
- 50 L/s for cooktops

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer, importers or distributors warranty
- Installer warranty
- Other information required by the BCA in the Building Consent Approval documents.

2 PRODUCTS

Kitchen extract systems

2.1 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filters, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.

Refer to SELECTIONS for options.

Bathroom and laundry extract systems

2.2 BATHROOM / LAUNDRY TWO-ROOM EXTRACT VENT

Mechanical venting system comprised of ceiling diffusers, metal ducting serving back to back rooms, a single motor unit housing mixed flow inline fan with two way switch, and proprietary vent cap and roof flashing.

Refer to SELECTIONS for options.

2.3 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical fan ducted system comprised of ceiling fan, filters, controls, aluminium foil flexi ducting joined to a solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

2.4 WALL MOUNTED FAN, DUCTED TO EXTERIOR WALL

Mechanical fan ducted system comprised of wall fan, solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

2.5 THROUGH WALL FAN UNIT

Through wall fan unit with exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

2.6 LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Laundry dryer vent comprised of, filter, metal ducting, exterior weatherproof grille and flashing.

Refer to SELECTIONS for options.

Component

2.7 ELECTRICAL FAN SWITCH

Independent switch connected to socket outlet located near fan / unit.

Refer to SELECTIONS for run on timer requirements.



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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.

Installation - mechanical ventilation

3.3 INSTALL KITCHEN RANGEHOOD

Install rangehood to AS/NZS 3000, AS/NZS 60335.1 and manufacturer installation instructions. Connect unit with ducting to exit either through roof or exterior wall / soffit. Plug into electrical socket.

3.4 INSTALL BATHROOM / TOILET / LAUNDRY EXTRACT FANS

Install exterior ducted fans to manufacturer requirements to AS/NZS 3000 and NZBC G4/AS1. Duct through to roof or exterior wall / soffit. Plug into electrical socket.

3.5 INSTALL THROUGH WALL FAN UNIT

Install through wall fan unit to manufacturer requirements to AS/NZS 3000 and NZBC G4/AS1. Plug into electrical socket.

Refer to SELECTIONS for options

3.6 INSTALL LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Install exterior ducted fans to manufacturer requirements.

3.7 INSULATION CLEARANCE

Provide 50mm clearance between insulation and motor unit / electrical enclosure. Insulation can abut ducts.

3.8 ELECTRICAL INSTALLATION

Install switch and socket outlets to AS/NZS 3000 and AS/NZS 60335.1. Refer to electrical section(s) for requirements.

Completion & commissioning

3.9 COMPLETION MATTERS

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

3.10 COMPLETION - TESTS & CERTIFICATION

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

3.11 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

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4 SELECTIONS

Kitchen extract systems

4.1 KITCHEN RANGEHOOD EXTRACT - DUCTED

Location:	Refer to drawings
Manufacturer:	Fisher & Paykal or approved
Product/model:	Refer Fixtures Schedule for selection.
Duct type/size:	ULX150 – Unilux Range hood Ducting Wall / Eave – KIT
Cladding:	Refer drawings
Wall grille type/size:	Part of duct kit
Cowl type:	Part of duct kit

Bathroom and laundry extract systems

4.2 BATHROOM / LAUNDRY TWO-ROOM EXTRACT VENT

Location:	Refer to drawings
Manufacturer:	Refer architectural drawings electrical fixtures schedule
Product/model:	Refer architectural drawings electrical fixtures schedule
Fan type/size:	Inline
Diffuser type:	Refer architectural drawings electrical fixtures schedule
Switch type:	2 way with run on timer
Duct type/size:	150mm Ø
Roofing:	Metal roofing
Flashing:	Refer to 4821 Flashings
Cowl type:	Part of kit

4.3 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Location:	Refer to drawings
Manufacturer:	Refer architectural drawings electrical fixtures schedule
Product/model:	Refer architectural drawings electrical fixtures schedule
Fan type/size:	Inline
Diffuser type:	Paltech diffuser
Switch type:	With run on timer
Duct type/size:	150mm Ø
Grille type/size:	Powdercoated aluminium grille to match cladding.
Cladding:	Refer drawings
Cowl type:	Part of kit

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7673 HEAT PUMP SYSTEMS

1 GENERAL

This section relates to heat pump air conditioning systems.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

L10 :	Centile Level, sound level that is equalled or exceeded for 10% of the time.
HFC:	Hydro-fluorocarbon
mm Hg:	mm mercury - unit of pressure
NIWA	National Institute of Water and Atmospheric Research
ASHRAE	American Society of Heating and Air Conditioning Engineers
IRHACE	Institute of Refrigeration, Heating and Air Conditioning Engineers

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G4/AS1	Ventilation of buildings
AS 1324.2	Air filters for use in general ventilation and air conditioning - methods of test
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1571	Copper - seamless tubes for air conditioning and refrigeration
AS/NZS 2107	Acoustics - Recommended design sound levels and reverberation times for building interiors
AS/NZS 3666.1	Air handling and water systems of buildings - Microbial control - Design, installation and commissioning
AS/NZS 3823.1.1	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.1: Non-ducted airconditioners and heat pumps - Testing and rating for performance
AS/NZS 3823.1.2	Performance of electrical appliances - Airconditioners and heat pumps - Part 1.2: Ducted airconditioners and air-to-air heat pumps - Testing and rating for performance
AS/NZS 3823.2	Performance of electrical appliances - Air conditioners and heat pumps - Energy labelling and minimum energy performance standard (MEPS) requirements
AS 4254.1	Ductwork for air handling systems in buildings - Flexible duct
NZS 4303	Ventilation for acceptable indoor air quality
AIRAH DA9, ASHRAE or Carrier	Manual calculation methods
ACADS-BSG Camel, Carrier E20	Electronic calculation methods

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Installer's warranty for the system under normal environmental and use conditions against failure.

2 years	Execution warranty

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Provide this warranty on the installer's standard form.

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Manufacturer's warranty for the system under normal environmental and use conditions against failure.

5 years: Warranty

Provide this warranty on the manufacturer's standard form.

Requirements

1.5 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.6 DRAWINGS AND BROCHURES

Submit, on request for review drawings and brochures of units, grilles and any other elements that affect the interior finishes.

1.7 QUALIFICATIONS

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

Handling or recovering refrigerant to be carried out by the appropriate Approved Filler and/or Handler, with a test certificate under the HNSO Act.

1.8 AIR CONDITIONING LOAD CALCULATIONS

General: Calculate the cooling and heating loads using one of the following:

- Manual methods: AIRAH DA9, ASHRAE or Carrier.
- Electronic methods: ACADS-BSG Camel, or Carrier E20

1.9 AIR CONDITIONING DESIGN BASIS

General

Outside design conditions: Use outdoor design conditions listed in publications from NIWA, ASHRAE, IRHACE or other reliable sources for weather data, for the location geographically closest and most relevant to the site.

Inside design conditions

Summer: 22°C dry bulb, 50% relative humidity.
Winter: 21°C dry bulb.
Limit the temperature difference in air conditioned spaces served by the same zone or system to ± 1.5°C when measured:

- Between any 2 points in the space from floor level to 1500mm above floor level, > 2000mm from cooking equipment and > 1000mm from any other appliance.
- When outside conditions are in the range specified above.
- After the plant has been operating for one hour.
- In the same 5 minute period.

Divide the systems into temperature controlled zones to meet the specified permissible temperature variation and documented system divisions.
Where ventilation requirements are not met by natural means and do not comply with NZBC G4/AS1, supply fresh air to spaces with air conditioning systems via the air handling system, or separate mechanical ventilation system in accordance with NZS 4303.

Heating

Reverse cycle.

Building Enclosure

Refer to drawings for construction of windows, walls, floors, roofs and insulation.

External window shading: Type: ~

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Internal window shading: Type: ~

Noise
Indoor noise emitted - to AS/NZS 2107, depending on space served, occupancy and activity. Noise received in all habitable rooms shall not exceed that permitted by the applicable Territorial Authority for the time of day or day of the week for the zoning of the site. Not more than L10: 35dbA between 2300 and 0700 hours. This shall apply to both the property in question and the neighbouring properties.

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

All units, filters, controls, pumps, traps, drain trays, refrigerant

1.11 MAINTENANCE CONTRACT PROPOSAL

Provide a proposed contract for the ongoing servicing of the heat pump system. Refer to SELECTIONS.

2 PRODUCTS

Material

2.1 REVERSE CYCLE UNITS

Split system heat pumps shall meet the requirements of AS/NZS 3823.1.1 and AS/NZS 3823.1.2 with minimum energy performance standards (MEPS) in accordance with AS/NZS 3823.2.

Provide effective outdoor coil defrost facility that prevents room temperature dropping more than 2°C during defrost.

2.2 CABINETS

Aluminium, powder coated steel or moulded acrylonitrile-butadiene-styrene (ABS) plastic with zinc - coated steel or stainless steel fasteners. Insulate and vapour seal cabinet and drain trays to prevent external condensation under all operating conditions.

2.3 DRAIN TRAYS

Aluminium, stainless steel or plastic to collect all moisture inside indoor and outdoor units.

2.4 FILTERS

Washable panel type.(85% of arrestance when tested to AS 1324.2, Test Dust No.4 or Class EU2 rated.

2.5 COILS

Copper tube with aluminium plate fins.

2.6 CONTROLS

Provide as a minimum the following functions:

- Temperature control for each zone located to accurately sense zone temperature.
- Fan speed selection for multi and variable speed fans.
- Day/night zone changeover if scheduled.
- Time switch for each system with (6 temperature programs per day, separate programs for each day of the week, manual set point over ride and 'Vacation' or 'Holiday' temperature set back.

2.7 REFRIGERATION PIPEWORK KIT

Split system manufacturer's standard pre-charged piping kit.

2.8 REFRIGERATION PIPEWORK CUSTOM

Copper tubing, de-oxidised seamless refrigeration quality, either half hard or soft drawn. Jointing shall be brazed or flared connections to equipment.

2.9 REFRIGERANT

Refrigerant HFC type with no phase out date, such as R410a or R407a, unless approved otherwise.

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3 EXECUTION

Conditions

3.1 DELIVERY

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

3.2 STORAGE

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

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed location of pipes, ducts and controls.

3.4 CONCEALED PIPING

All refrigeration and condensate piping shall be concealed within the building structure unless stated otherwise.

3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation of the system with other subcontractors work.

3.6 PROTECT SURFACES

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

Application

3.7 INSTALLATION PIPE WORK

Install general pipe work to AS/NZS 1571

Purge the system at all times with dry nitrogen when brazing or heating pipework.

Pipes to be installed to manufacturer's requirements, adequately supported, also arranged and sized to prevent excessive pressure drop and ensure correct circulation of refrigerant and oil.

All refrigeration pipework test to 1800 kPa.

Insulate all refrigerant and drain piping that may sweat with chemically blown closed cell elastomeric insulation. Suction lines are to be insulated over the entire length between connections to indoor and outdoor units. Protect insulation from sunlight and mechanical damage.
Insulation thickness: 13mm for pipes < DN 20, 19mm otherwise.

Provide trapped (DN 20 condensate drains to AS/NZS 3666.1 from each indoor coil and safety tray, to an approved drain point. Provide drains from each reverse cycle outdoor coil unless casing freely drains to a roof or other location where condensate will not cause damage or pond.

3.8 INSTALLATION UNIT

Provide clearance around outdoor units for condenser air flow and maintenance access, to manufacturer's requirements. Ensure discharge air does not short-circuit to condenser intake.

For equipment at ground level, ensure they are mounted on 100mm level concrete plinth or equivalent impervious material.
Provide internal or external flexible duct connections at indoor unit.

For vibration isolation of suspended units, provide (4 metal spring or rubber-in - shear isolation mountings with (25mm static deflection and 98% isolation efficiency. For floor mounted units, provide neoprene waffle pads. Bolt in place.

If leaks or condensation from equipment could cause nuisance or damage to the building or its contents provide a galvanized steel safety tray under the equipment.

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3.9 INSTALLATION REFRIGERANT

The completed system including all pipework, to be evacuated to 0.2mm Hg or better with a vacuum pump and maintained at this pressure for 2 hours, then broken with refrigerant.

Completion

3.10 COMMISSIONING

Commission the systems to manufacturer's recommendations using instruments calibrated in the last 12 months. Submit signed commissioning check list on completion.

3.11 CLEANING

Clean filters, outdoor coils, grilles and diffusers.

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.12 PROTECT

Protect new work from damage.

4 SELECTIONS

4.1 HEALTHY HOMES HEATING CALCULATIONS

The contractor / sub-contractor are to allow for all heating requirements per the the separate Heating Calculator (spread sheet) requirements.

4.2 HEAT PUMP

Location:	Refer to drawings
Manufacturer:	Daikin or Hitachi
Indoor Unit Model:	Refer to HHA calculations / Refer to fixtures & fittings schedule in drawings
Outdoor Unit Model:	Refer to HHA calculation / Refer to fixtures & fittings schedule in drawings
Note:	All heat pumps to have a separate, dedicated circuit.

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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 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	general lighting service
IP	international (ingress) protection classification
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)

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AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
NZS 4514	Interconnected smoke alarms for houses
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Components for low voltage surge protection devices

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services

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

Warranties

1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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

Requirements

1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.5 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electricity (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

1.7 SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER

Before installation work commences obtain from the electrical engineer a Certified Design. The Certified Design is to comply with the Electricity (Safety) Regulations (2010), regulation 58.

1.8 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations 2010, prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high risk electrical work as required by regulation 70.

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1.9 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

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2 PRODUCTS

2.1 INSPECTIONS

As required

2.2 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.

2.3 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).

2.4 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.5 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 3439.3, or AS/NZS 61439.3, and installed in accordance with AS/NZS 3000. Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.6 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.7 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.8 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units.
Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.9 HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

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2.10 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3100, AS/NZS 3112 and AS/NZS 3113, single or multi gang as detailed.

2.11 FIRE & SMOKE ALARM SYSYEM

Refer to SELECTIONS.

2.12 SURGE PROTECTION

Protection for the homes appliances with IEC 61643 Class ll surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class lll surge protection to switched socket outlets.

2.13 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.

2.14 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.15 LIGHT FITTINGS

Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.16 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with AS/NZS 60335.1.

2.17 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.

Fire rated accessories

2.18 WALL BOXES AND SWITCH UNITS - FIRE RATED

Proprietary intumescent pad for plastic electrical sockets installed in plasterboard lined fire rated partitions providing an acoustic barrier and fire protection. Refer to SELECTIONS for type.

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3 EXECUTION

3.1 MAIN SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

3.2 METER BOX

Fit to meter box manufacturer and Electricity Retailer requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1 fig 69. Arrange for meter installation and connection.

3.3 DISTRIBUTION BOARD

Fit to AS/NZS 3000 and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.4 CIRCUIT PROTECTION

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.5 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.6 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.7 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.

3.8 RCD - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.9 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.10 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

3.11 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.

3.12 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.13 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

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3.14 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements.

3.15 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.16 ELECTRIC HOT WATER SYSTEM

For storage heaters, wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.17 SMOKE ALARMS

Install Type 1 domestic smoke alarm system to NZBC F7/AS1 3.0 **Domestic smoke alarms**, NZS 4514 and to the alarm manufacturer requirements. Fit neatly and without damage to the surrounding finish.

3.18 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

3.19 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.20 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.21 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer recommendations:

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

3.22 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

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Fire rated sealers and liners

3.23 SEAL ALL PENETRATIONS

Seal all penetrations, including in and around conduits and sleeves, in accordance with manufacturer instructions. For fire and/or acoustic rated elements, maintain the rating with the seal systems.

3.24 PROVIDE CABLE SLEEVES

Provide PVC sleeves formed from pipe sections, unless fire and/or acoustic systems require sleeves for other building elements and/or different material for the sleeve.

Fire rated accessories

3.25 INSTALL WALL BOXES AND SWITCH UNITS - FIRE RATED

Install proprietary fire rated wall boxes and switch units in accordance with manufacturer instructions.

Completion & Commissioning

3.26 COMPLETION MATTERS

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

4 SELECTIONS

4.1 GENERAL ELECTRICAL NOTES

- These drawings shall be read in conjunction with the relevant specifications and the requirements for TRC. It shall be deemed that the electrical services contractor has (prior to submitting their tender,) fully informed themselves of the nature of the work by an onsite examination, specification, all drawings, and any other foreseeable means to carry out the work contained here within in preparation of their tender.
- All services shall be maintained in operation during the entire contract. any down times to be arranged with client in advance and prior to disconnection.
- Locate all existing services on site prior to commencing any work.
- All items are to be installed to the manufacturers requirements and are to be seismically restrained to the requirements of NZS 4219, the building code and the specific New Zealand standards.
- All electrical work is to comply with AS/NZS 3000.
- Minimum cable size for power is 2.5mm' cu and for lights is 1. 5 mm' cu. increase the cable size as required to meet any voltage drop limit and or fault loop impedance and disconnection time in accordance with AS/NZS 3000.
- Refer to the manufacturers recommendations for appliances.
- All internal cabling is to be concealed within walls, ceiling and floor space.
- Flush boxes in all walls shall be separated by the space of at least one timber stud or dwang.
- Run cables on tray or on catenary wire above ceiling.
- Ensure space for residential dishwasher as per community group housing requirements. (group to provide own dishwasher)

4.2 NOT USED.

4.3 UNISON CONNECTION

Where not specifically shown on the civil services plan, obtain the relevant information and or contracts from kaianga Ora, so that the relevant and foreseeable development allowances can be reasonably made. Where the sub contractor is uncertain of aspect on the above, allow to bring this to the attention of the Project administrator during Tender.

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4.4 METER BOX

Location:	Next to the DB, If not shown on the electrical drawings confirm with client.
Brand / type:	Surface mounted wall-mounted zinc plate powder coated metal box or ABS plastic with glazed panel door
Note:	Confirm prior to installation that the DB is not within a braced wall

4.5 DISTRIBUTION BOARD

Location:	Refer to the Drawings and or the Ground & First Floor Data & Electrical Plans. Internal adjacent to Meter box
Brand:	Vynco
Type:	V20, V30 and or V40 as required to suit typology
Brand / type:	DBF flush board with 20% minimum spare capacity
Earth Pin:	Allow for the 'Earth' pin to be protected by a plastic "Toby box".
Smart Metre:	Externally-recessed, and wall-mounted in a weather- protected enclosure that is located adjacent to the main- entry or where provided, in a utilities and service room.
Note:	Confirm prior to installation that the DB is not within a braced wall

4.6 INTERIOR SOCKETS (OUTLETS)

Also Refer to the electrical drawings.

Location:	Refer to the Drawings and the below requirements
Brand:	Vynco Home
Single Vertical Type:	10A V WH
Single 32A Type:	32A H WH
Double Vertical Type:	10A V & Sw WH
Double Horizontal Type:	10A H & Sw WH
Perm Connection:	16A WH
Coverplate colour:	White
Switch module colour:	White
Standard/ below bench Height:	500mm above finished floor level
Above bench Height:	+250mm
From internal corner:	500mm
Flushbox:	Flush Box Plastic Thread, 88FBP - 35650040

Locations + Requirements

Living and dining:	4 double socket outlets suitable for phone/data and TV.
Kitchen:	4 double-socket outlets (x3 double-socket outlets above bench height including an outlet for the fridge plus x1 dedicated outlet for the stove- Ensure one outlet is suitable for a microwave
Bedroom > 9m2:	3 outlets (incl x1 per each bed side).
Bedroom < 9m2:	2 outlets (incl x1 per each bed side).
Bathrooms:	1 double-socket outlet located adjacent to the vanity at 1m above the finished floor level.
Hallways	1 double-socket outlet
Laundries:	1 double-socket outlet
Garage	1 double-socket outlet

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4.7 INTERIOR SWITCHES

Location:	Refer to the Drawings and the below requirements
Single Vertical Gang:	1G 16A WH (2S1 - 30000010)
Single 32A Vertical Gang:	1G 32A WH (2S1/32 - 30000080)
Single 40A Vertical Gang:	Ec 1G 40A WH (EC770/40WE - 29411240)
Double Vertical Gang:	2G 16A WH (2S2 - 30000020)
Double IP Rated Vertical Gang:	Ec 2G 16A Ip66 WH (EC770/2IPWE - 29411200)
Triple Vertical Gang:	3G 16A WH (2S3 - 30000030
Coverplate colour:	White
Switch module colour:	White
Height:	1000mm above finished floor level and aligned with the door handles
Extracts:	Includes a separate isolating switch-control with a time-delayed, automatic shut-off.
Security Lights	Includes a separate isolating switch-control
General:	Hallways to have two-way switches at each end

Lighting

4.8 LIGHTING - INTERNAL FITTINGS

Type:	Vynco Jolie LED Downlight, 3000K.
Code:	VE3CR
Bulb:	8w
Notes:	Provides 100lm/W. Install per manufacturers guidelines.

Fire Requirments

4.9 FIRE REPORT REQUIRMENTS

Refer to the fire report. The sub / contractor is to allow for all fire and smoke collars, Flush Box Intumescent Pads, and all requirements where and required and under the guidance of the fire report

4.10 SMOKE ALARMS

Location:	At least one smoke alarm is required in each: Bedroom, Hallway and stairway, Living-area and (where applicable) separate dining-area, Garage (where there is direct internal-access).
Brand	Heiman Smoke Alarm
Type:	HM-626PHS
General:	To EN14604:2005 Standard
Access Friendly Requirements:	Smoke alarm systems must be abel to be adapted to provide audio and visual warnings.
Fire Report:	Refer to the fire report as required
Notes:	It is not permitted to locate smoke alarms within 300mm of an exposed ceiling beam or ceiling apex or a wall. Mechanically-operated fire protection systems (such as fire windows) are not permitted.

Kitchen Appliances

4.11 KITCHEN COOKTOP - 60CM

Refer architectural finishes and fixtures schedule if provided, or as selected by the client or contractor.

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4.12 KITCHEN OVEN

Refer architectural finishes and fixtures schedule if provided, or as selected by the client or contractor.

4.13 RANGEHOOD - 60CM

Refer architectural finishes and fixtures schedule if provided, or as selected by the client or contractor.

4.14 DISHWASHER

Refer architectural finishes and fixtures schedule if provided, or as selected by the client or contractor.

Heating General

4.15 HEAT PUMPS, BATHROOM HEATERS AND PANEL HEATERS

Refer to specification section 7673 heat pump and heating for all heat pump, panel heater and bathroom heater requirements

General

4.16 ELECTRICAL SOLID FIXING - REFER SPEC

Location:	As and where suitably required
Requirements:	Ensure that there is solid wall fixing as required for all electrical items, specifically allow for 90x45mm on flat to suit suitable dryer set out (wall hung and future item by tenant)

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