

Choicedesign

SPECIFICATION

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

Lot 176 Oakfields

Project Specification

Lot 176 Oakfields , Amberley, Christchurch, New Zealand

Project Ref: 21126

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masterspec

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

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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	Structural design actions - Wind loads
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 4781	Code of Practice for Safety in Welding and Cutting
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 NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Good Practice Guidelines - Excavation Safety
WorkSafe NZ	Scaffolding in New Zealand - Good Practice Guidelines

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
- Bricklaying
- Roofing 2 Profiled metal roofer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- 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.

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.

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
- 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

Revisions: 1 at full size

2.2 DOCUMENT RECEIPT - HARD COPIES

Hard copies of plans, specifications and other documents issued for construction shall be supplied by contractor

2.3 DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS

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

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

There are no work section requirements.

1.3 SHOP DRAWINGS - ADDITIONAL ITEMS

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

1237 WARRANTIES

1 GENERAL

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

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

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

1.1 SCHEDULE SECTION

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

Warranties

1.2 PROVIDE WARRANTIES

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

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

1.3 WARRANTIES - INSTALLER/APPLICATOR

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

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

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

Submission

1.5 REVIEW BY CONTRACTOR

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

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 NZS3902:2004 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.

2 SELECTIONS**Project warranties / guarantees****Guarantees - Contractor - Master Build Services Ltd****2.1 MASTER BUILD SERVICES LTD - 10 YEAR STANDARD GUARANTEE**

Provide a 10 Year Standard Guarantee (including all optional cover), include all costs in the contract price. Detach the guarantee application form from the guarantee agreement. Complete the form, obtain all required signatures (builder and owner). 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 the Master build Services acceptance letter 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 (builder and owner) and forward the form to Master Build Services.

Weathertightness and watertightness warranty**2.2 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.

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

Site preparation

1.4 SITE ACCESS

Access to the site is limited to: Refer to site plan

1.5 WORKING AREA

Limited to the following designated working areas on the site:
Refer to site plan

1.6 SITE AND SOIL SURVEYS

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

Temporary construction

1.7 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.

1.8 TEMPORARY SITE FENCING

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

1.9 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

First aid

1.10 FIRST AID EQUIPMENT

Provide first aid equipment.

1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 SITE FENCING

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

Construct the fence with:

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

1.5 SITE FENCING - NON-PUBLIC AREAS

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

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

Scaffolding

1.6 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:

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

Temporary services

1.7 WATER

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

1.8 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.

1.9 MOBILE PHONE

Provide on-site access to mobile phones

1.10 COMPUTER FACILITIES

Provide on-site temporary computer facilities complete with an email and internet connection capable of sending, receiving and printing site communications, this includes Cell phones that can download PDF..

Care and protection - Project**1.11 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.

1.12 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous**1.13 CONSTRUCTION KEYING AND SECURITY**

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

1.14 TEMPORARY STORAGE

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

Rubbish removal**1.15 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.

1260 PROJECT MANAGEMENT

1 GENERAL

This general section relates to project management requirements including:

- Meetings
- Reporting
- Communicating and records
- Confidentiality
- Working hours
- Health and safety

Site Meetings

1.1 PURPOSE OF SITE MEETINGS

The purpose of site meetings is to:

- Ensure that the Contractor has all information required to construct the work
- To address and clarify aspects of construction of the work including quality
- To address issues relating to project delivery including, site progress and cost.

1.2 SITE MEETING ATTENDANCE

The following persons to attend:

- Contractor
- Designer
-

1.3 REPORTING

The following reports are required to be presented at site meetings:

Contractor: A detailed status report

1.4 SITE MEETING MINUTES

The contract administrator is to keep full minutes of all site meetings and arrange distribution to all those involved within 3 working days.

The minutes are to record

- Documentation and information issued and required
- Directions and variations issued
- Confirmation of contract insurances
- Programme items
- General business
- Site health and safety
- Payment claim processing including costing variations

Reporting

1.5 CONTRACTORS DETAILED STATUS REPORT

A contractor's detailed status report is to address the following:

- Progress performance, addressing actual progress against the programme and any variance from the programme.
- Procurement progress on parts of the work being undertaken under a monetary allowance including the time by which direction must be given on monetary allowances to conform to the programme.
- Details of measures being taken to get work back on programme where there has been a delay and details of any future events that will or are likely to affect compliance with the programme.
- Compliance with the issued Building Consent and notification of any work or inspections that have not been passed by the BCA inspector.
- Compliance with the issued Resource Consent and any compliance issues.
- Site health and safety including any notifiable incidents.
- Details of any discrepancies in the contract documents that require clarification or determination
- A list of information requests by the contractor, the date when they were made, the person who they were directed to and the date by which a response is required.
- A variation report including progress on agreed variations, variations to be agreed and anticipated variations and the time implication of variations.
- Variation costing and the adjusted contract price including an assessment of the cost of known and potential variations.
- Review of sums not yet directed for expenditure.

Cost control

1.6 MEASUREMENT

Give reasonable notice to the contract administrator before covering up work which requires to be measured.

1.7 DAYWORK VOUCHERS

To be signed by the contractor's representative as confirming the labour, times and materials used, before being supplied to the contract administrator.

Communicating and records

1.8 MEANS OF COMMUNICATION

Communications between the parties shall be as follows:

Directions:	In writing delivered by email with a copy by post or hand
Meeting minutes:	In writing delivered by email
RFI's:	(Requests for information) by email or in writing to the contract administrator

1.9 DELIVERY OF COMMUNICATIONS

Deliver communications to the addresses listed in the contract agreement by means as allowed. Where such addresses are not included in the contract agreement:

- deliver to the addressee by hand; or
- post to the postal address stated in the project directory; or
- deliver to the street address as stated in the Project Directory; or
- send by email to the email address stated in the Project Directory; or
- where agreed, deliver via a file hosting service or an electronic project management system.

1.10 SERVICE OF NOTICES

Serve notices to the addresses listed in the contract agreement by means as allowed.

1.11 CHANGE OF ADDRESS

The principal, contractor and the contract administrator must notify the others if they change their address for delivery or transmission of communications.

1.12 RECORDS

Ensure all records specified are kept, held and collated on site in a form that makes the information easily accessible when it is needed. Distribute copies as and when necessary to those persons entitled under the contract to that information.

1.13 EXISTING STRUCTURES PHOTOGRAPHS

Before commencing work take digital photographs recording existing conditions of existing buildings and structures, including adjacent areas that may be affected by the carrying out of the contract works. Include adjacent roadways and footpaths and neighbouring buildings and the like. Where there is existing damage to adjacent buildings and/or structures, ensure that the photographs adequately record the extent of the damage or failure. Refer to SELECTIONS.

1.14 PROGRESS PHOTOGRAPHS

Take digital photographs recording progress. Refer to SELECTIONS.

Confidentiality**1.15 CONFIDENTIALITY - PUBLICITY**

Unless specifically agreed photographs and other images of the work are not to be used by the contractor, subcontractors, material suppliers and others involved in the construction of the works.

Photographs taken for record purposes may be kept but must not be passed to other persons.

1.16 CONFIDENTIALITY AGREEMENT

Where required as a condition of the contract arrange for workers to provide a confidentiality agreement. Workers who have not provided such an agreement shall be excluded from the site.

Hold Points and Notification Points

Refer to section 1232 INTERPRETATION & DEFINITIONS for definition of hold points and notification points.

Working hours**1.17 WORKING HOURS RESTRICTIONS**

Comply with territorial authority consent conditions and noise and nuisance controls, in addition work on site is restricted to:

Weekdays:	Normal work hours
Saturdays:	9-5
Sundays:	9-5
Public holidays:	9-5

Work outside these hours may be permitted with the contract administrators consent. Allow a minimum of 24 hours notice (in writing) when seeking the contract administrators consent. If the contract administrator consent is given obtain any required permits and permission for such work

Health and safety**1.18 HEALTH AND SAFETY LEGISLATION**

Refer to the requirements of the [Health and Safety at Work Act 2015](#). Comply also with all other relevant New Zealand safety legislation.

The Contractor will ensure, so far as is reasonably practicable, that, each subcontractor they engage and each separate contractor is aware of and complies with its obligations under health and safety-related law.

For the purpose of health and safety-related law, the contract administrator and others involved in contract administration and observation and construction monitoring will not at any time have management or control of the Workplace.

1.19 HEALTH AND SAFETY REGULATIONS, CODES AND GUIDES

Comply with:

- Relevant New Zealand safety legislation including, Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, also [Health and Safety in Employment Regulations 1995](#) as amended by that Regulation and the appropriate Health and Safety at Work Regulations.
- WorkSafe NZ publications including "Guidelines for the provision of facilities for general safety in the construction industry".
- Relevant codes of practice, guides, guidelines and standards.

Until further regulations are made under the [Health and Safety at Work Act 2015](#) to cover them, the transitional provisions of the Act continue in force until revoked or amended.

1.20 HEALTH AND SAFETY IMPLEMENTATION

Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

Co-operate, consult and co-ordinate health and safety matters with each PCBU including all subcontractors, suppliers, separate contractors, others engaged on the project and others who may be affected by the construction of the works.

Identify any significant hazards and risks.

Maintain proper procedures for dealing with any emergencies that may arise. Immediately investigate accidents, identify their cause and maintain a register of accidents and serious harm.

Provide a copy of any report which the contractor is required to make to a public authority on any accident which is associated with carrying out the contract works and results in serious harm to any person.

Refer to individual work sections for detailed requirements on this project.

1.21 SUSPENSION OF HAZARDOUS WORK

On the request of the contract administrator, acting on reasonable grounds, suspend any identified hazardous activities and proceed to eliminate, isolate or minimise them in order to comply with the Act, without prejudice to any other rights of the principal under the contract.

1.22 SITE SAFETY PERSON

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

1.23 HEALTH AND SAFETY PLAN

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

- identification of existing and potential construction hazards and risks
- Any design construction safety matters identified in section 1220 PROJECT and/or any separate project design construction safety report.
- safety procedures to eliminate, isolate or minimise construction hazards and risks
- the equipment to be used to minimise the hazards and risks
- the maintenance of a register of hazards and risks for the site
- the name and qualifications of the site safety person
- emergency procedures
- first aid facilities and safety equipment
- the methodology for notifying, recording and investigating accidents and injuries.

Advise the contract administrator of unusual or atypical features in the Plan in addition to any features already identified in section 1220 PROJECT and/or any separate project design construction safety report. Keep a copy of the plan in the site office.

1.24 MAINTAIN HEALTH AND SAFETY PLAN

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

1.25 COMPLY WITH SITE SAFETY PLAN

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

1.26 INFORM WORKERS OF HAZARDS AND RISKS

Inform workers and others on the site of:

- hazards and risks they may be exposed to while working or other legitimate activities
- hazards and risks they may create while working which could harm others
- how these hazards and risks may be minimised
- emergency procedures
- the location of first aid facilities and safety equipment.

1.27 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority/WorkSafe NZ.

Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe NZ, to the Health and Safety at Work (Hazardous Substances) Regulations.

1.28 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.

2 SELECTIONS**Meetings****2.1 SITE MEETINGS**

Frequency:	Only if required
Time:	TBC with admin
Venue:	onsite

Photographs**2.2 EXISTING STRUCTURES PHOTOGRAPHS**

Copies required:	Electronic, To keep for reference.
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2.3 PROGRESS PHOTOGRAPHS

Position:	Majority section on construction (For reference)
Frequency:	After each stage of construction
Copies required:	1

1270 CONSTRUCTION

1 GENERAL

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

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

1.1 SCHEDULE SECTION

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

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

Quality control and assurance

1.2 QUALITY ASSURANCE

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

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

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

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

1.3 NOTICE

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

1.4 NOTIFIABLE WORK

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

Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

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

1.6 ACCEPTABLE NOISE LEVELS

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

1.7 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.8 ROADWAY AND FOOTPATH

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

1.9 VEHICLE CROSSING

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

1.10 DIRT AND DROPPINGS

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

1.11 DAMAGE AND NUISANCE

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

1.12 SMOKE FREE REQUIREMENTS

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

1.13 RESTRICTIONS

Do not:

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

Set-out and tolerances**1.14 SURVEY INFORMATION**

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

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

1.15 DATUM

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

1.16 SET-OUT

Set out the work to conform with the drawings.

1.17 USE OF SET-OUT INSTRUMENTS

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

1.18 CHECK DIMENSIONS

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

1.19 TOLERANCES

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

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution**1.20 EXAMINE PREVIOUS WORK**

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

1.21 REPORT DEFECTIVE PREVIOUS WORK

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

1.22 EXECUTION GENERALLY

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

1.23 EXECUTION - NO DETAIL IS PROVIDED

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

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

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

1.24 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

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

1.25 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work**1.26 DEFECTIVE OR DAMAGED WORK**

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

Hot work - fire safety

1.27 HOT WORK

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

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

1.28 COMBUSTIBLE MATERIAL

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

1.29 HOT WORK PERMIT

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

1.30 FIRE SYSTEMS

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

1.31 DURING SUSPENDED WORK

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

For hot works in confined spaces, prevent potential ignition of flammable gases, to [NZS 4781](#) clause 6.5.

Qualifications**1.32 QUALIFICATIONS GENERALLY**

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

1.33 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

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

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

1.34 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

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

1.35 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.36 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

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

1.37 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.38 REPLACEMENT OF PERSON

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

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

Products**1.39 NEW PRODUCTS**

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

1.40 COMPATIBILITY OF PRODUCTS

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

1.41 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

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

Refer to individual work sections for any special requirements.

1.42 SUBSTRATE CONDITIONS

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

1.43 INSTALLING PRODUCTS

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

1.44 COMPLY WITH STANDARDS

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

1.45 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.46 INCOMPATIBLE PRODUCTS

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

Samples

1.47 SAMPLES FOR REVIEW

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

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

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

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

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

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

Refer to SAMPLES clauses in work sections for further detail.

1.48 CONTROL SAMPLES

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

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

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

1.49 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.50 PROTOTYPES - TESTING

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

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

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

1.51 PROTOTYPES - REVIEW

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

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

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

1.52 PROTOTYPES - GENERAL

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

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

Spares & maintenance products**1.53 SPARES & MAINTENANCE PRODUCTS**

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

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

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

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

Cleaning during the works**1.54 PERIODIC SITE CLEANING**

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

1.55 TRADE CLEANING

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

Remove protection**1.56 REMOVE PROTECTION**

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

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

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

Refer to individual work sections for any special removal requirements.

Completion**1.57 SPECIAL REQUIREMENTS**

Refer to individual work sections for any special completion requirements.

1.58 LEAVE WORK

Leave work to the standard required for the following procedures.

1.59 COMPLETION - TESTS & CERTIFICATION

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

1.60 REMOVE CONSTRUCTION WASTE

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

1.61 COMPLETE ALL SERVICES

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

1.62 CLEANING BY CONTRACTOR

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

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

1.63 CLEANING BY COMMERCIAL CLEANER

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

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

Commissioning**1.64 SPECIAL REQUIREMENTS**

Refer to individual work sections for any special commissioning requirements.

1.65 MOVING PARTS

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

1.66 COMMISSIONING - TESTS & CERTIFICATION

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

1.67 INSTRUCTION AND DEMONSTRATION

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

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

1.68 SECURITY AT COMPLETION

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

Practical completion submission**1.69 ADDITIONAL PRACTICAL COMPLETION INFORMATION**

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

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

1.70 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

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

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

- ~

Defects period submissions**1.71 DEFECTS REMEDIATION - SUBMISSIONS**

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

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

Completion submissions**1.72 FINAL COMPLETION - SUBMISSIONS**

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

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

2210 PREPARATION & GROUNDWORK

1 GENERAL

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

- footings and floor slabs

Documents

1.1 DOCUMENTS

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

[NZS 3604](#) Timber-framed buildings
[WorkSafe NZ](#) [Good Practice Guidelines - Excavation Safety](#)

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

1.3 SITE SAFETY

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

1.4 ARCHAEOLOGICAL DISCOVERY

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

2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

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

2.2 SAND FILL

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

2.3 HARD FILL

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

2.4 DRESSING COURSE

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

2.5 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

3 EXECUTION

3.1 WASHOUT BAY FOR TRUCK

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

3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the [WorkSafe NZ](#), [Good Practice Guidelines - Excavation Safety](#).

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

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

3.5 EROSION CONTROL

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

3.6 SURFACE PREPARATION

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

3.7 STOCKPILE TOPSOIL

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

3.8 GENERAL EXCAVATION

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

3.9 ROCK EXCAVATION

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

3.10 FOUNDATION EXCAVATION

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

3.11 INADEQUATE BEARING

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

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

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.

Confirm any changes with the territorial authority.

For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

3.12 STANDARD OF COMPACTION

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

3.13 GRANULAR BASE FOR SLABS

To conform to [NZS 3604](#), section 7.5.3, **Granular base**. Consolidate with a vibrating roller. Blind the surface with 20mm of coarse sand or sand/cement and roll ready to receive a damp-proof membrane.

3.14 GENERAL BACKFILLING

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

3.15 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

3155AS ALLIED READY SUPERSLAB FLOOR SYSTEM

1 GENERAL

This section relates to the **Allied READY Superslab** an engineered designed, reinforced concrete floor system incorporating polystyrene pods or QPOD moulded plastic pods.

It includes:

- Standard engineered design in accordance with Codemark Certificate of Conformity
- Specific engineered design

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

AS 1366.3 Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3104 Specification for concrete production
NZS 3109 Concrete construction
NZS 3114 Specification for concrete surface finishes
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
CodeMark **GM-CM30086**-RevD - Allied Superslab Concrete Floors.

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allied READY Superslab Technical Manual

Allied READY Superslab Brochure

BRANZ Appraisal 964 - Allied Superslab Concrete Floors

Manufacturer/supplier contact details:

Company: **Allied Concrete Limited**

Web: www.alliedconcrete.co.nz

Email: sales@alliedconcrete.co.nz

Telephone: 0800 4 255433

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Allied READY Superslab floor system product or component, or associated Allied Concrete products.

1.5 QUALIFICATIONS

Tradespeople to be competent, experienced and familiar with the Allied READY Superslab floor system materials and techniques specified.

1.6 STEEL REINFORCING COMPLIANCE

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

1.7 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used during construction.

Include records of workmanship during construction and photographs of as-built details. Make the information available to the Building Consent Authority inspector on request.

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Producer Statement - Construction PS3 from the installer
- Producer Statement - Construction Review PS4 from;
- Christchurch: HFC: Civil and Structural (South) Ltd
- or from a relevant approved structural engineer

Performance

1.9 COMPLIANCE CODEMARK CERTIFICATE- STANDARD DESIGN

Allied READY Superslab floor system meets the requirements of the CodeMark® certificate CodeMark™ GM-CM0086-RevD when used within the conditions and limitations of its Certificate of Conformity.

2 PRODUCTS

System components

2.1 QPOD PODS

Allied READY Superslab proprietary purpose made QPOD moulded plastic pods. Sizes 550mm x 550mm x 220mm and when 4 are clipped together form a 1100mm x 1100mm pod. Each pod has a raised portion in the centre to hold reinforcing steel at the correct height. QPOD extensions and end caps are available.

2.2 SPACERS

Allied READY Superslab proprietary or QPOD plastic spacers.

Materials

2.3 BLINDING

20 mm minimum compacted GAP 7 or sand blinding.

2.4 TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to [NZS 3631](#).

2.5 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to [NZS 3604](#): clause 7.5.4, Damp-proof membrane (DPM). Refer to SELECTIONS.

Reinforcement - concrete

2.6 REINFORCEMENT

Bars to [AS/NZS 4671](#). Grade 500E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings.

2.7 INTERNAL CORNER REINFORCEMENT

Minimum 2 x HD12 bars Grade 500E to [AS/NZS 4671](#).

2.8 MESH

As specified in the design documentation.

2.9 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.10 CONCRETE - ALLIED SUPERSLAB APPLICATIONS - STANDARD DESIGN

20MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size. Allied Superslab Mix for direct placement and for pump applications. Mix code to be 202CSS for 20Mpa applications or 252CSS for 25Mpa applications.

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 STORAGE

Take delivery of and accept all materials and accessories dry and undamaged. Store on timber fillets on hard ground protected from weather, contamination and damage in a secure area clear of any building operation.

Handle and store reinforcing steel and accessories without damage or contamination. 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. Store steel fabric flat.

3.4 HANDLING

Avoid distribution and contact with damaging substances. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage.

Site preparation

3.5 SITE CLEARANCE

Clear the slab area of any vegetation and topsoil down to the subgrade level.

3.6 BUILDING PLATFORM

Create a building platform to a level surface approximately 300mm minimum below finished floor level, i.e. Slab thickness + 20mm blinding. Cut and/or fill sloping sites. Confirm finished floor level. The prepared platform should be to a tolerance of +0 to -10mm.

3.7 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 Allied READY Superslab Technical Manual.

3.8 TEMPORARY BUILDING PLATFORM DRAINAGE

Construct suitable drainage to keep excessive ground water off the building platform during and after construction as required, and to ensure run off onto adjoining properties is avoided.

Application - pre-installation

3.9 UNDERGROUND SERVICES

Ensure underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and according to Allied READY Superslab floor system requirements, or within the slab depth where applicable.

3.10 BLINDING LAYER

Spread GAP 7 blinding layer to a minimum 200mm past the outside edge of the slab, compact to a level layer no greater than 50mm thick. Refer to BUILDING PLATFORM for tolerances.

3.11 FORMWORK

Construct formwork as required, well braced and tied to remain in position, straight and plumb during construction. Ensure formwork will provide for the topping depth, including rebates and the required concrete finish.

3.12 INSTALL DAMP-PROOF MEMBRANE

Apply 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.

Application - Allied READY Superslab floor system**3.13 PLACE QPOD PODS**

Place QPOD pods in a regular pattern using the spacers in the specified grid pattern to fit the floor plan ensuring the correct dimensions for all perimeter footings and internal ribs. If extensions with pods are required ensure that the overall dimension of each pod does not exceed 1100mm x 1100mm. Use beam spaces 100mm, 300mm and 400mm to space pods to form ribs and footings, and to locate and support reinforcing steel. Cut holes for services and trim around piles as required on site.

3.14 INSTALL SPACERS

Install spacers and locations to the Allied READY Superslab floor system requirements.

Form standard ribs between pods using Allied READY Superslab 100mm spacers. Place the spacers at a minimum of one spacer along each edge of each pod or part pod. The ribs in both directions form a waffle pattern throughout the slab.

Form the edge beam using Allied READY Superslab 300mm spacers. Place the spacers 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 Allied READY Superslab 300mm spacers. Place the spacers at a minimum of one spacer along the edge of each pod or part pod.

3.15 PLACE REINFORCING: GENERAL

Install specified reinforcing to Allied READY Superslab Technical Manual. Ensure specified minimum cover requirements are maintained.

3.16 PLACE REINFORCING STEEL TO INTERNAL RIBS

Place rib reinforcing bars in the bottom of the internal ribs and supported in the correct position by the Allied READY Superslab spacers. Lap XD 12 bars 600mm minimum. At the junction with the edge beam, each rib bar to sit on top of the edge beam bars and extend to the outermost bar. Allow for 40mm side cover within the rib. Place 1 x XD12 bar in each 100mm wide rib and 2 x XD12 bars in each 300mm wide rib. Allow 50mm bottom cover to bars where DPM is used.

3.17 PLACE REINFORCING STEEL TO EDGE BEAM

Place the two edge beam reinforcing bars in the bottom of the edge beam and supported in the correct position by the Allied READY Superslab spacers. Tie one top edge beam bar below the mesh at the perimeter of the area covered by the polystyrene pods. Lap XD 12 bars 600mm minimum. At corners, the inner bottom bars and the top bars cross each other and extend to 50 mm from the outside face of the edge beam. Tie these bars together where they cross. Tying of edge beam steel is only required at corners.

3.18 PLACE REINFORCING FOR RE-ENTRANT CORNER STEEL

Place two XD12 bars, 1200mm in length across the corner. Tie to the top of the mesh at re-entrant corners at 200mm centres with 50mm side cover from the internal corner.

3.19 PLACE REINFORCING MESH AND CHAIRS

Place reinforcing mesh over the pods and support on the mesh chairs spaced at 1200mm centres minimum, with at least two transverse bars of adjacent mesh minimum placed per pod and with one mesh chair minimum per part pod. Lap mesh 225mm minimum or to suit mesh suppliers details and tied at all laps.

3.20 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings. Form a rebate in slab for masonry veneer construction with a width dependent on the veneer width, cavity width and overhang. Waterproof the rebate with a bituminous sealer on both the vertical and horizontal faces.

3.21 TOPPING SLAB DEPTH

Concrete slab thickness 85mm minimum. Refer to Allied READY Superslab details.

3.22 PRE-PLACEMENT INSPECTION

Arrange for excavations, formwork and reinforcement to be inspected and passed by the Building Consent Authority.

3.23 EQUIPOTENTIAL BONDING REINFORCING

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

3.24 CONCRETE PLACEMENT AND COMPACTION

Ensure the rib and edge beam canals are clean, free of debris. Pour the floor in a single pour using only Allied Superslab Mix concrete and 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.

Use Allied Superslab Mix for placement in the floor directly from the concrete truck chute or Allied Superslab Mix concrete for placement in the floor by concrete pump.

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 and ensure minimum specified topping thickness is achieved.

3.25 CONCRETE FINISHING

Float and trowel to provide a U3 finish to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes. Exposed edges of foundation to F5 finish.

3.26 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

3.27 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints as shown on the plans after hardening to a depth of 25mm within 24 hours.

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 engineer.

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. 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.

3.28 CLEAN OUT SHRINKAGE CONTROL JOINTS

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

Finishing**3.29 STRIKE FORMWORK**

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

3.30 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.

Completion**3.31 COMPLETION MATTERS**

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

3.32 CLEAN UP

Clean up surrounding areas following completion of the concrete placement.

4 SELECTIONS

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

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

4.1 DAMP-PROOF MEMBRANE

Type: As per membrane spec

4.2 ALLIED READY SUPERSLAB QPOD POD SYSTEM

Brand: Allied READY Superslab

Pod size: 1100mm x 1100mm x 220mm

Plastic spacers: as required

Chairs: as required

4.3 CONCRETE SURFACE FINISH

Location: As per plans

Finish class: U3 (interior)

4.4 ALLIED READY SUPERSLAB APPLICATIONS - STANDARD DESIGN

Concrete strength: 20MPa

Mix code: TBC

3813 ENGINEERED WOOD PRODUCTS

1 GENERAL

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

- laminated veneer lumber (LVL)
- laminated timber members
- other types of engineered wood

1.1 RELATED WORK

Refer to 3821 TIMBER FRAMING for general timber framing and installation of engineered wood products.

Documents

1.2 DOCUMENTS

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

NZBC B1/VM1	Structure
AS/NZS 1170	Structural Design Actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
AS/NZS 1328.1	Glue laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1491	Finger jointed structural timber
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2754.1	Adhesives for timber and timber products - Adhesives for manufacture of plywood and laminated veneer lumber (LVL)
NZS 3602	Timber and wood-based products for use in buildings
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
AS/NZS 4364	Timber - Bond performance of structural adhesive

1.3 MANUFACTURER DOCUMENTS

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

~

Copies of the above literature are available from ~

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

1.4 ABBREVIATIONS

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

LVL	Laminated veneer lumber
-----	-------------------------

Requirements

1.5 QUALIFICATIONS

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

Laminated timber fabricators to be certified to [AS/NZS 1328.1](#).

1.6 LAYOUT DRAWINGS

Provide a layout drawing with each element identified by a unique identifier. Provide details of specific design bracing requirements

1.7 PRODUCER STATEMENT

Provide a signed producer statement showing the manufacturer details.

1.8 LVL DESIGN

To [NZS 3603](#) in general and in particular the manufacturer's technical information. Complying with [NZBC B1/VM1](#), [AS/NZS 1170](#) and [NZS 1170.5](#) when installed.

1.9 LVL MEMBERS TEST

Laminated veneer lumber products are to be tested and the properties monitored to the requirements of the Plywood Association of Australasia.

2 PRODUCTS**Sustainable Timber****Materials - LVL****2.1 LVL BEAMS, POSTS, JOISTS, RAFTERS**

To [AS/NZS 4357.0](#), to required sizes and lengths and the manufacturer design properties. Manufacture to [AS/NZS 4357.0](#) and the manufacturer design properties.

Components - LVL**2.2 ADHESIVE, LVL**

Veneers to be bonded with Type A marine bond (phenolic) to [AS/NZS 2754.1](#).

2.3 ADHESIVE, LVL I-JOIST

I-Joist flange to web joint to be formed with resorcinol phenol adhesive (Type A bond to [AS/NZS 2754.1](#) and Type 1 to [AS/NZS 4364](#)) permanent and durable structural bond.

2.4 TREATMENT, LVL EXTERIOR

Insecticide treatment to H3/H3.1 LOSP or H3/H3.2 CCA (preservative code 01 or 02) to [NZS 3640](#) and AS/NZS 1604.1. Equivalent solvent based preservative for treating cut ends on site. Refer to SELECTIONS.

2.5 TREATMENT, LVL INTERIOR

Treatment to H1/H1.2 to [NZS 3640](#) and AS/NZS 1604.1. Equivalent solvent based preservative for treating cut ends on site. Refer to SELECTIONS.

Accessories**2.6 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**Manufacture - LVL****3.1 LAMINATED VENEER LUMBER, MANUFACTURE**

To [AS/NZS 4357.0](#) and the manufacturer's design properties.

Delivery**3.2 DELIVER, HANDLE AND STORE**

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

Application - LVL**3.3 ERECTION**

Refer to the manufacturer's guidelines for the installation of laminated veneer lumber structural elements. Ensure all elements are correctly located, plumb and true to line and face. Carry out the erection of LVL and associated support framing for houses and similar structures to the requirements of [NZS 3604](#). Comply with [NZBC B1/VM1](#), 6.0 Timber. Reseal cut ends, holes, notches and the like of treated LVL with a brush on solvent based preservative. Prop long length beams and lintels at the mid span until the moisture content has reached a suitable level for the application of internal linings.

3.4 TIGHTEN BOLTS

Check and tighten all fixing bolts after erection is completed.

3.5 HOLES AND PENETRATIONS

To manufacturers requirements.

Application - connectors**3.6 CONNECTORS**

Refer to the manufacturer's guidelines for installation. Ensure all elements are correctly located, plumb and true to line and face. Ensure that the manufacturers recommended type and quantity of fixings are used.

Completion**3.7 REPLACE**

Replace or repair damaged elements.

3.8 REMOVE

Remove debris, unused materials and elements from the site.

3.9 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS**4.1 LVL FRAMING**

Location:	As per plans
Type/application:	Wall Framing
Brand/name:	Nelson Pine LVL
Size:	90x45, 145x45
Treatment:	H1.2

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 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

SG Structural grade to [NZS 3604](#), 1.3 **Definitions**

Documents

1.2 DOCUMENTS

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

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

1.3 DIMENSIONS

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

2 PRODUCTS

Materials

2.1 TIMBER FRAMING, TREATED

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

2.2 APPEARANCE TIMBERS

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

2.3 STRAPPING

Treated to [NZBC B2/AS1](#), [NZS 3602](#), table 1 and to [NZS 3640](#), clause 6.3.1.

Species: Radiata pine

Grade: LVL8

Size: 90mm x 45mm or 140mm x 45mm

2.4 WALL DWANGS, NOGS AND BLOCKING

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

2.5 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

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

2.6 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components**2.7 NAILS**

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

2.8 SCREWS

Wood screws to the requirements of [NZS 3604](#), 2.4 Fastenings and Fabrication, and section 4, **Durability**, and of the type, number and form required for each screw application to [NZS 3604](#), sections 6 - 10.

2.9 BOLTS AND COACH SCREWS

Bolts and coach screws complete with washers, to the requirements of [NZS 3604](#), clause 2.4.5 Bolts and Coach Screws, and section 4, **Durability**, and of the type, number and form required for each particular junction to [NZS 3604](#), sections 6 - 10.

2.10 THREADED RODS

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

2.11 TIMBER CONNECTORS AND FIXINGS

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

2.12 BRACING STRAPS

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

2.13 POWDER ACTUATED FASTENERS

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

2.14 CORROSION RISKS

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

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

3 EXECUTION**Conditions****3.1 PROTECT TIMBER**

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

3.2 EXECUTION

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

3.3 SEPARATION

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

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

3.4 FRAMING MOISTURE CONTENT

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

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

3.5 TOLERANCES

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

- Deviation in plan, up to 10 metres, 5mm
- Deviation in plan, over 10 metres, 10mm total
- Deviation from horizontal, up to 10 metres, 5mm
- Deviation from horizontal, over 10 metres, 10mm total
- Deviation from vertical position per 3 metres, 3mm
- Deviation from horizontal and vertical, within openings, 3mm.

Application

3.6 SET-OUT

Set-out framing generally in accordance with the requirements of [NZS 3604](#), to carry superimposed loads, and as required to support sheet linings and claddings. 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.

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 CAVITY BATTENS

Fit and fix 40mm 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).

3.19 FIT BRACING

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

3.20 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.21 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion**3.22 CLEAN UP**

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

3.23 LEAVE

Leave work to the standard required by following procedures.

3.24 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS**4.1 EXTERIOR WALL FRAMING - RADIATA PINE**

Member	Species	Grade	Treatment
Exterior walls:	Radiata Pine	LVL8	H1.2

4.2 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Trusses:	Radiata Pine	SG8	H1.2
Purlins:	Radiata Pine	SG8	H1.2
Valley boards:	Radiata Pine	Merch	H1.2

4.3 INTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata Pine	LVL8	H1.2
Structural and braced walls:	Radiata Pine	LVL8	H1.2

4.4 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Structural	Radiata Pine	Merch	H3.1

4161T THERMAKRAFT UNDERLAYS, FOILS & DPC

1 GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM, wall underlays, roofing underlays and accessories.

1.1 RELATED WORK

Refer to 3101

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
NZS 4214	Methods of determining the total thermal resistance of parts of buildings
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

[BRANZ Appraisal 329](#) - Supercourse 500™ Damp-Proof Course and Concealed Flashing

Manufacturer/supplier contact details

Company: Thermakraft Ltd

Web: www.thermakraft.co.nz

Email: info@thermakraft.co.nz

Telephone: 0800 806 595

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

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

Requirements

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

1.7 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of Thermakraft™ products and familiar with Thermakraft™ technical literature and the related documents listed in this design i.e. [NZMRM CoP](#) NZ Metal Roof and Wall Cladding Code of Practice.

2 PRODUCTS**Materials****DPC****2.1 PERRIMETER DPC**

Thermakraft Perrimeter DPC, a heavy kraft impregnated with high grade bitumen and coated with higher heat resistant bitumen to [AS/NZS 2904](#) and to the appropriate test methods set out in AS/NZS 4347.

DPM**2.2 DAMP-PROOF MEMBRANE - MEDIUM DUTY, BLACK**

Thermathene Black™, a minimum of 250 microns polyethylene film. Complies with [NZS 3604](#), 7.5.4, Damp-proof Membrane, to [NZBC E2/AS1](#). Refer to SELECTIONS for type of jointing tape.

Roofing underlays**2.3 BITUMINOUS SELF-SUPPORTING ROOFING**

Thermakraft 215™, bituminous self-supporting roofing underlay to [NZS 2295](#).

Accessories**2.4 WINDOW AND DOOR SEALING TAPE - ALUBAND™**

Thermakraft Aluband™ Window Sealing Tape system consists of synthetic faced reinforced bituminous window sealing tape, in widths of 75mm, 150mm and 200mm, Thermakraft Aluband™ Corner Moulding™ piece, used in conjunction with the Thermakraft Aluband™ Hand Tool to ensure good adhesion and a tight fit into corners. Refer to Thermakraft Data Sheet for installation details and [BRANZ Appraisal 878](#).

2.5 MULTI-FIT SEALS FOR UNDERLAY PENETRATIONS

Thermakraft™ Multi-Fit seals are a UV resistant EPDM material which forms a weathertight air seal for pipes and penetrations with a high strength acrylic adhesive suitable for use on all underlay systems. Available for use with pipes 15-110mm and cables 7-22mm both are pre-punched ensuring a tight accurate fit. No special tools required for installation.

2.6 AUSMESH SAFETY MESH

Ausmesh™ 3002mm x 150 x 300mm galvanized or PVC coated safety mesh to [AS/NZS 4389](#).

2.7 GUTTER AND UNDER FLASHINGS

Thermakraft 215™, bituminous breather type underlay to [NZS 2295](#) cut to width for use under valley, apron flashing and internal gutters.
Soffit liner cut to width from Thermakraft 215™ bituminous breather type underlay. Refer to SELECTIONS.

2.8 TAPE

Thermakraft™ tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:

- Thermakraft™ White General Purpose Underlay Tape
- Thermakraft™ Foil Tape 150
- Thermakraft™ Window Sealing Tapes, used to repair damaged bituminous underlays

3 EXECUTION

Conditions**3.1 GENERAL REQUIREMENTS**

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

3.2 STORAGE

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

3.3 INSPECTION

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

Application DPC**3.4 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.

3.5 DPC TO MASONRY AND BRICK VENEER

Lay Supercourse 500™ DPC 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**3.6 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 Thermakraft™ White GP Tape 60mm.

3.7 METAL CLADDING ON TIMBER CAVITY BATTENS

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

Application - roofing underlay**3.8 SAFETY MESH**

Lay Thermakraft™ Ausmesh™ 300 safety mesh over exposed roof areas fixed in accordance with [AS/NZS 4389](#) and [NZMRM CoP](#).

3.9 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 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.

3.10 GUTTER AND UNDER FLASHINGS

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

Completion**3.11 CLEAN UP**

Clean up as the work proceeds.

- 3.12 LEAVE
Leave work to the standard required by following procedures.
- 3.13 REMOVE
Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Damp Proof Course

- 4.1 THERMAKRAFT - PERRIMETER DPC
Location: Timber Bottom Plates
Type: Thermakraft™ Perrimeter DPC

Damp Proof Membrane

- 4.2 THERMATHENE BLACK™
Location: Under Slab
Type: Thermathene Black™
Joining tape: Thermakraft™ White General Purpose Underlay Tape

Roofing Underlays

- 4.3 THERMAKRAFT BITUMINOUS ROOFING UNDERLAYS
Location: Roof Underlay
Type: Thermakraft 215™ bituminous self-supporting roofing underla
Joining tape: Thermakraft™ white GP tape 60mm

Window / Door Sealing System

- 4.4 THERMAKRAFT - ALUBAND™
Location: Window & Door opening
Sill/head tape: 150mm Thermakraft Aluband™ (for 90mm framing)
Sill corners: Thermakraft Aluband™ Corner Moulding™
Butterfly corners: 75mm Thermakraft Aluband™ (across head corners)

Safety Mesh

- 4.5 THERMAKRAFT - AUSMESH 300
Location: Wall Framing top plate
Type: Ausmesh™ 300
Finish: PVC

Gutter and Under Flashing

- 4.6 GUTTER AND UNDER FLASHINGS
Location: Apron & Gutter
Type: Apron flashing underlay 415mm wide, Gutter flashing underlay 300mm wide
Joining tape: Thermakraft™ window sill tape 75mm Aluband™ Xtreme™

4161TH DRISPACE FOILS, UNDERLAYS, TAPES & DPC

1 GENERAL

This section relates to the application of TCL Hunt DriStud™ products, comprising:

- DriStud Bozz Window Flashing Tape

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC B2	Durability
NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
AS/NZS 2904	Damp proof courses and flashings
AS 1530.2	Methods for fire tests on building materials, components and structures – test for flammability of materials
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - Materials
AS/NZS 4201.4	Pliable building membranes and underlays - Methods of test - Resistance to water penetration
AS/NZS 4389	Roof Safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
AAMA 711-13	Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Product
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

CodeMark™ Certificate of Conformity for DriStud Wall Wrap Cert No.[CM70019](#) (31 October 2019)
CodeMark™ Certificate of Conformity for DriStud Bozz Window Flashing Tape Cert No.[CM70063](#) (31 October 2019)

DriStud Product Literature;
DriStud Wall Wrap
DriStud Bozz Window Flashing Tape

Manufacturer/supplier contact details;

Company: DriStud, a division of TCL Hunt Ltd
Web: www.dristud.co.nz
Email: technical @dristud.co.nz
Telephone: 0800 374 7883

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
15 years For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements**1.5 NO SUBSTITUTIONS**

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

1.6 QUALIFICATIONS

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

Performance - General**1.7 COMPATABILITY TEST BETWEEN SEALANTS & DRISTUD COOL WINDOW FLASHING TAPE**

The following sealants are tested and found to be compatible in accordance with AAMA 713-08 "Voluntary Test Method to Determine Chemical Compatibility of Sealants and Self-Adhered Flexible Flashings", using test temperatures of 5°C, 30°C, 60°C and 80°C with DriStud Cool Window Flashing Tape.

- Dowsil 790
- Dowsil 795
- Dowsil 758
- Gorilla Firestop MS
- Holdfast Fixall HG MS
- Fixall 220MS
- Masterseal NP 150
- Sika AT
- Sika MS

1.8 COMPATABILITY TEST BETWEEN TRADE-SEALS (MARSHALL INNOVATIONS) & DRISTUD WALL WRAP

Trade seals from Marshall Innovations and DriStud Wall Wrap samples were tested and found to be compatible according to AAMA 713-08 "Voluntary Test Method to Determine Chemical Compatibility of Sealants and Self-Adhered Flexible Flashings", using test temperatures of 5°C, 30°C, 60°C and 80°C.

1.9 COMPATIBILITY BETWEEN DRISTUD PROCTOR PASSIVE WRAPTITE SA AND MULTIPLE SUBSTRATES

DriStud Passive Proctor Wraptite SA is compatible with the following substrates;

- Exterior Gypsum Sheathing
- Aluminium (painted or mill finish)
- OSB
- Most rigid insulation
- Cast in place concrete
- Rigid Vinyl
- Pre-painted steel
- Galvanized metal
- Pre-cast concrete
- Steel
- Concrete block
- Plywood

2 PRODUCTS

Wall**2.1 DRISTUD BOZZ WINDOW FLASHING TAPE**

Window sealing system that can also be used for general sealing of wall penetrations. DriStud Bozz window flashing tape is a bituminous modified self adhesive polymeric faced tape, 1000µ thick, CodeMark™ certified, suitable for residential or commercial, timber or steel framed buildings. To [NZS 3604](#) Building Wind Zones up to and including Extra High. 1000µm thick, and available in 3 widths, 75mm, 150mm and 200mm.

3 EXECUTION**Conditions****3.1 GENERAL REQUIREMENTS**

Design application and installation of DriStud products to [NZBC E2/AS1](#), CodeMark™ certification, DriStud Technical Literature and Industry Codes of Practice.

3.2 STORAGE

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

3.3 INSPECTION

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

3.4 OPENINGS

Run the underlay over openings and leave covered until windows and doors are ready to be installed. Form openings in the membrane by cutting a 45° diagonal from each corner of the penetration. Fold back the flaps inside the opening and staple to the penetration framing. Cut off excess underlay flush with the internal face of the wall frame. Restrain from bulging into the drained cavity to [NZBC E2/AS1, 9.1.8.5](#).

3.5 INSTALL STUD STRAPS

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

Application - DriStud Window Flashing Tapes**3.6 DRISTUD BOZZ WINDOW FLASHING TAPE**

Install DriStud Bozz Window Flashing Tape to [NZBC E2/AS1](#), 9.1.5 and in accordance with DriStuds instructions.

Completion**3.7 CLEAN UP**

Clean up as the work proceeds.

3.8 LEAVE

Leave work to the standard required by following procedures.

3.9 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Wall

4.1 DRISTUD BOZZ WINDOW FLASHING TAPE

Location:	External Wall Framing
Brand:	DriStud
Type:	Bozz Window Flashing Tape
Width:	TBC

4221 TIMBER BOARD CLADDING

1 GENERAL

This section relates to the supply and fixing of timber cladding:

- weatherboards

Related work

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for underlays, foils and DPC.
Refer to 4223 PLYWOOD CLADDING for plywood used as a rigid backing.

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
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring
NZS 3631	New Zealand timber grading rules

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

~

Manufacturer/supplier contact details

Company: Health Based Building
Web: <https://www.healthbasedbuilding.com/>
Email: enquiries@healthbasedbuilding.co.nz
Telephone: 03 366 4044

Performance

1.4 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](#).

1.5 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations.

2 PRODUCTS

Materials

2.1 UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

2.2 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, 40mm thickness, width and height to match timber framing studs. To [NZS 3602](#), table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

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

2.4 WEATHERBOARDS

Profile (unless detailed otherwise) to [NZS 3617](#), species and grading to [NZS 3602](#), [NZS 3631](#), minimum treatment to [NZS 3602](#), table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in long lengths, with all knots excluded.

2.5 COVER BOARDS, BOXED CORNERS AND SCRIBERS

To profiles as detailed, with species and grading to [NZS 3602](#), [NZS 3631](#), but with all knots excluded. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

Components

2.6 NAILS, STAINLESS STEEL

65mm x 2.8mm and 75mm x 3.15mm stainless steel.

2.7 FLASHINGS

Material, grade and colour as detailed and scheduled and to [NZBC E2/AS1](#); Table 21: Compatibility of materials in contact and Table 22: 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.

2.8 SOAKERS, ALUMINIUM/ZINC COATED STEEL

Machine folded aluminium/zinc coated steel sheet to profile of weatherboard and mitred corner joints.

2.9 SOAKERS, COPPER

Machine folded half-hard copper sheet to profile of weatherboard and mitred corner joints.

Finishes

2.10 PRIMER

Water borne acrylic or solvent borne oil-alkyd primer to suit the timber and proposed painting system.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution to [NZBC E2/AS1](#): 3.0 Weathertightness risk factors, and 9.0 Wall claddings, 9.1.8 Drained cavities.

3.2 STORAGE

Take delivery of timber, dry, unmarked and undamaged. Store on site, laid flat and true under cover.

3.3 SUBSTRATE

Before starting fixing ensure that the substrate conforms with [NZS 3604](#), section 2, table 2.1, **Timber framing tolerances** and the requirements of [NZS 3604](#), section 6, **Foundation and subfloor framing** and [NZBC E2/AS1](#), governing support for timber board cladding.

3.4 MOISTURE CONTENT

Immediately before starting fixing, test the moisture content of the boards. Use an electrical moisture meter to test 5% of boards, but not less than 10 boards in the centre of the length. Do not start fixing until 90% of the values obtained are within the range in [NZS 3602](#) table 4, Allowable moisture content (%) at time of installation or in the case of framing timber at time of enclosure.

Application - preparation

3.5 PRIMING AND SEALING

If not pre-finished before delivery, coat all faces and edges immediately the block stack is opened. Then fillet stack, laid flat and true, until fixed. Keep dry and undamaged. Coat to suit the paint system specified in painting sections. Allow to re-coat if exposed for more than one month before the final coating is applied.

3.6 FIX UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.7 INSTALL DRAINED CAVITY

20mm minimum thickness drained cavity to [NZBC E2/AS1: 9.0 Wall claddings](#), where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over 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). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.8 PENETRATIONS

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

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

3.9 SET-OUT

Using laser or mechanical devices set-out the overlap boards to ensure dimension to exposed face in line of weather is constant and that boards remain horizontal/vertical. Use a string line to set out all nailing that will be visible in the finished work. Align all nailing accurately in straight lines.

Application - fixing**3.10 FIXING, PAINT FINISH**

Prime all cut ends before fixing. Drill all fixings located within 25mm of board ends. Punch all fixings.

3.11 FIXING VERTICAL SHIPLAP WEATHERBOARDS

Adjust horizontal set-out to ensure there is a 2mm expansion gap between successive boards. Using full length boards only, clench nail tongue to every fixing point (nogs at 480mm centres). Nail other side of board just clear of lap. Line nails horizontally across the boards.

3.12 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to [NZBC E2/AS1](#)

3.13 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

Completion**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 all debris, unused materials and elements from the site.

4 SELECTIONS**4.1 BUILDING WRAPS/UNDERLAYS**

Refer to 4161 UNDERLAYS, FOIL AND DPC section

4.2 CAVITY BATTENS

Timber species: Radiata Pine
Treatment: H3.1

4.3 WEATHERBOARDS

Location: As per plans
Species: Radiata Pine
Treatment: H3.1
Profile: Bevel-back
Dimensions: 195mm x 9mm

4.4 NAILS, SCREWS AND FASTENINGS

Type: Impulse Nail 65 x 2.8mm Stainless Steel
Centres: As per manual

4.5 PRIMER

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

4239 SOFFIT CLADDING

1 GENERAL

This section relates to the supply and fixing of cladding to the underside of exterior soffits, verges and eaves and includes:

- Magnesium Oxide sheet

1.1 RELATED WORK

Refer to ~ for ~.

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

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 2269.0	Plywood - structural - Specifications
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring
NZS 4251.1	Solid plastering: Cement plasters for walls, ceilings and soffits

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

~ ~

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years For ~

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

Refer to the general section 1237 WARRANTIES for additional requirements

Requirements

1.5 QUALIFICATIONS

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

1.6 HEALTH AND SAFETY

Comply with all manufacturer/supplier and [WorkSafe](#) New Zealand requirements for health and safety.

1.7 NO SUBSTITUTIONS

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

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:

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Provide this information prior to practical completion.

2 PRODUCTS

Fibre cement soffit cladding

2.1 MAGNESIUM OXIDE SOFFIT CLADDING

Magnesium Oxide soffit cladding, manufactured from treated cellulose fibre, Portland cement, sand and water, cured by high pressure autoclaving and manufactured to [AS/NZS 2908.2](#). Refer to SELECTIONS.

2.2 NAILS - GALVANIZED

Hot-dip galvanized nails for fibre cement sheet as required by manufacturer / supplier documents. Refer to SELECTIONS.

2.3 NAILS - STAINLESS STEEL

316 Stainless steel nails for fibre cement sheet as required by manufacturer / supplier documents. Refer to SELECTIONS.

2.4 SCREWS - STAINLESS STEEL

Stainless steel screws for fibre cement sheet as required by manufacturer / supplier documents. Refer to SELECTIONS.

Fibre cement soffit cladding - Components

2.5 SOFFIT JOINTERS

Extruded uPVC jointer.

2.6 CAPPING MOULDS

Extruded uPVC capping mould.

2.7 SCOTIA MOULDS

Extruded uPVC scotia mould.

Fibre cement - Accessories

2.8 FLASHING TAPES

Single sided medium density closed cell PVC foam tape, with pressure sensitive acrylic adhesive on one side of tape. Tape thickness and width to manufacturer technical literature.

2.9 SEALANT

Facade sealant or similar. Refer to the sheet manufacturer technical literature for selection and use requirements.

2.10 SEALER

For jointed systems, seal all sheet edges prior to fixing.

Timber profiles

2.11 TIMBER TRIM

18 x 18 mm timber trim with 6 mm minimum chamfer to internal corner. Species and grading to the requirements of [NZS 3602](#), table 2, Requirements for wood-based building components to achieve a 15-year durability performance, treated H3.1 unless durable heartwood. Select appearance grades to [NZS 3631](#) requirements, but with all knots excluded.

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 HANDLING

Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject all product with damaged faces or edges

3.3 SUBSTRATE

Do not commence work until the substrate is of the standard required for the specified finish; 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 soffits are fixed.

3.4 SEAL FIBRE CEMENT SHEET EDGES

Seal site cut sheet edges prior to installation. Seal sheet edges around penetrations.

3.5 PENETRATIONS

Form small holes to accommodate penetrations through the soffit as per the method detailed in the sheet manufacturer's technical literature.

Install fibre cement sheets**3.6 SHEET LAYOUT**

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

3.7 INSTALL SOFFIT CLADDING - JOINTERS AND CAPPING MOULDS

Cut sheets dry using score and snap method, hand guillotine or fibre cement shears. If these methods are not feasible, use an alternative manufacturer approved method. Ensure all edges and joints are fully supported. Insert uPVC jointers and capping moulds to manufacturer's requirements. Fix sheets complete with jointers and capping moulds. Refer to manufacturer's installation manual and SELECTIONS.

3.8 INSTALL SOFFIT CLADDING - EXPRESSED JOINTS

Cut sheets dry using score and snap method or hand guillotine. Ensure all edges and joints are fully supported. Install in seal sealing strip to framing at expressed joint locations. Fix sheets complete with required gap to form expressed joint detail. Refer to manufacturer's installation manual and SELECTIONS.

3.9 FIBRE CEMENT CLADDING FASTENER - SIZE AND LAYOUT

Fix sheets to framing using fixings and fixing methods as nominated in SELECTIONS. Fix to manufacturer's requirements.

3.10 SEALANTS - FIBRE CEMENT

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

3.11 PAINTING - FIBRE CEMENT

Refer to painting section/s for protective coating system.

Install timber profiles**3.12 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).

3.13 TIMBER TRIM

Using full lengths, scribe internal joints and mitre external and running joints. Fully support all joints and fix securely 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.

3.14 NAILING, PAINT FINISH

Punch nails and patch prime external trim being painted, before stopping as specified under painting preparation.

3.15 NAILING, CLEAR FINISH

Punch nails flush with the face of external trim being stained or clear finished.

Completion

3.16 COMPLETION MATTERS

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

4 SELECTIONS

Fibre cement soffit cladding

4.1 FIBRE CEMENT SOFFIT CLADDING

Location:	As per plans
Brand/ID:	Magnum Board Soffit Lining
Thickness:	9mm
Edge detail:	Square
Fixings/finish:	Impulse Nail 65 x 2.8mm Stainless Steel

Accessories

Finishes - factory applied

Finishes - cut edges

4.2 SITE FINISHES - CUT EDGES

Soffit: ~

4261 BRICK VENEER CLADDING

1 GENERAL

This section relates to clay brickwork as a veneer cladding.

It includes:

- Standard brick veneer cladding

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:

CB&PMA	New Zealand Clay Brick & Paver Manufacturer's Association
NZMTA	New Zealand Masonry Trades Association
BBFNZ	Brick and Blocklayers Federation of New Zealand

The following definitions apply specifically to this section:

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 B1/AS3	Structure
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2699.1	Built-in components for masonry construction - Wall ties
AS/NZS 2699.3	Built-in components for masonry construction - Lintels and shelf angles (durability requirements)
AS/NZS 2918:2001	Domestic solid fuel burning appliances - Installation
NZS 3103	Sands for mortars and plasters
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: materials and workmanship
SNZ HB 4236	Masonry veneer wall cladding
AS/NZS 4455.1	Masonry units, pavers, flags and segmental retaining wall units - Masonry units
BRANZ	Good practice guide: Masonry veneer
CB&PMA TB1	Design Note TB1 Two Storey Clay Brick Veneer Construction - Made Easy
CB&PMA TB2	Design Note TB2 Specification For The Stack Bond Brick Veneer System
ASTM D6134	ASTM D6134 / D6134M-07(2019)e1, Standard Specification for Vulcanized Rubber Sheets Used in Waterproofing Systems

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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Manufacturer/supplier contact details

Company	Canterbury Clay Bricks
Web:	https://clay-bricks.co.nz/
Email:	info@clay-bricks.co.nz
Telephone:	+64 3 341 5036

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty for:

~ years: For ~

Provide the warranty on the manufacturer/supplier's standard form.

Commence the warranty from the date of practical completion of the contract works.

Refer to the general section WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER

Provide an installer warranty for:

~ years: For ~

Provide the warranty on the installer's standard form.

Commence the warranty from the date of practical completion of the contract works.

Refer to the general section WARRANTIES for additional requirements.

Requirements**1.6 QUALIFICATIONS**

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

All work to be installed or supervised by a Registered Master Mason or Licensed Building Practitioner (LBP): Licensed for Bricklaying and Blocklaying 1: Brick/masonry Veneer. RBW must be supervised by an LBP.

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:

- Producer Statement - Construction from the installer of proprietary brick veneer systems.
- Other information required by the BCA in the Building Consent Approval documents.

Performance**1.9 DESIGN PARAMETERS - NON SPECIFIC DESIGN - EARTHQUAKE**

Design the installation to the seismic parameters of [NZS 4210](#) Masonry construction: materials and workmanship.

Refer to SELECTIONS for details.

1.10 COMPLIANCE - STANDARD BRICK VENEER SYSTEM

Brickwork to comply with [SNZ HB 4236](#) Masonry veneer wall cladding.

2 PRODUCTS**Materials****2.1 CLAY BRICKS**

To [AS/NZS 4455.1](#).

2.2 VERMIN PROOFING

Either:

- Proprietary plastic weephole vents built into open perpend.
- Galvanized hexagon 10 mm mesh of 1 mm diameter steel wire 100 mm wide, complete with galvanized steel staples. Fix across base of cavity if gaps in veneer exceed 13 mm.

2.3 FLASHING - SILL

To [NZBC E2/AS1](#) either:

- 2 ply asphaltic pliable waterproofing membrane to [AS/NZS 2904](#).
- 1.5 mm butyl rubber to [ASTM D6134](#).
- 0.5 mm pliable polyethylene to [AS/NZS 2904](#).
- Proprietary self-adhesive flexible flashing tape to [AS/NZS 2904](#).

2.4 FLASHING - JAMB

To [NZBC E2/AS1](#) either:

- 2 ply asphaltic pliable waterproofing membrane to [AS/NZS 2904](#).
- 0.5 mm pliable polyethylene to [AS/NZS 2904](#).
- Proprietary self-adhesive flexible flashing tape to [AS/NZS 2904](#).

2.5 DAMP-PROOF COURSE (DPC)

To [NZBC E2/AS1](#) either:

- 2 coats bitumen-based paint to [AS/NZS 2904](#).
- 1.0 mm min. bituminous sheet or heavy kraft strip laminate (saturated and coated with bitumen) to [AS/NZS 2904](#).
- 1.0 mm min. butyl rubber to [ASTM D6134](#).

2.6 DAMP-PROOF MEMBRANE (DPM)

0.25 mm min. polythene or polyethylene sheet to [AS/NZS 2904](#).

Components - general**2.7 SILLS**

Refer to SELECTIONS for type.

Components - standard brick veneer**2.8 WALL TIES**

To [AS/NZS 2699.1](#). Metal ties screw fixed to framing.

2.9 REINFORCEMENT

Galvanized wire joint reinforcement. Refer to SELECTIONS for type.

Accessories**2.10 SAND FOR MORTAR**

To [NZS 3103](#). Chloride levels not to exceed 0.04% by dry weight of sand.

2.11 MORTAR

Composed of Portland cement, sand and water with an admixture to the provisions of [NZS 4210](#): 2.2 Mortar. Obtain written approval of admixture being used. Obtain written approval if intending to use hydrated lime in the mortar.

2.12 ADMIXTURES

To [NZS 4210](#).

2.13 WATER

Clean, fresh and free from excess alkali, salt, silt and organic materials.

3 EXECUTION**Conditions****3.1 DELIVERY, STORAGE AND HANDLING**

To [NZS 4210](#) for aggregates, cement, bricks and reinforcement.
Take delivery of materials and goods and store on site and protect from weather or 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 - CONCRETE BASE

Check vertical and horizontal alignment. Any discrepancies exceeding the permitted tolerances shall be corrected before units are laid.

3.3 TIMBER FRAMING - STANDARD BRICK VENEER

Check timber framing stud spacing is in accordance with [NZS 3604](#).

3.4 PENETRATIONS

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

- brick veneer wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- brick veneer neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.5 MEASURE MATERIALS

Measure materials for mortar accurately by weight or volume using suitably calibrated equipment.

3.6 WET WEATHER

Keep bricks dry at all times prior to laying. Protect the top row of uncompleted brick walls. Protect freshly laid brickwork during interruption through rain and at completion of each day's work. Protect brickwork for a minimum of 6 hours.

3.7 COLD WEATHER CONSTRUCTION

When air temperature is below 5°C take the precautions required by [NZS 4210: 2.18](#) Cold weather construction.

3.8 HOT WEATHER CONSTRUCTION

When air temperature is above 25°C or there is a drying wind, or lower temperatures, take the precautions required by [NZS 4210: 2.19](#) Hot weather construction.

3.9 KEEP FACE WORK CLEAN

Keep clean during erection and until completion of the contract works. Turn back scaffold boards at night and during heavy rain. Do not rub face work to remove stains.

Installation - general**3.10 STANDARDS AND TOLERANCES**

To [NZS 4210](#), table 2.2 Maximum tolerances.
Refer to the general section CONSTRUCTION for general requirements.

3.11 COLOUR MIXING

Check all bricks delivered to site for colour variation, prior to commencing work. Ensure bricks are thoroughly blended from several pallets to ensure an even colour spread throughout the work.

3.12 UNIFORMITY

Carry up work with no portion more than 1500 mm above another at any time, raking back between levels.

3.13 BONDING

Lay bricks to the required bonding in the various locations. Refer to SELECTIONS/drawings.

3.14 PROVIDE WEEPHOLES

Provide weepholes at the bottom of cavities and cells to [SNZ HB 4236](#) and [NZBC E2/AS1, 9.2.6](#), **Cavities**, and as necessary to drain moisture to the outside air. Provide vent gap at the top of the veneer.

3.15 INSTALL VERMIN PROOFING

Either:

- Proprietary plastic weep-hole vents built into open perpend.
- Fold and staple one edge of the mesh to the substrate, with the mesh sloping down towards the veneer. Set the other edge into the mortar joint by half the thickness of the veneer or 50 mm, whichever is less.

3.16 CAVITY VENTILATION

Ventilate to outside air with top and bottom openings to the requirements of [SNZ HB 4236](#) and [NZBC E2/AS1, 9.2.6](#), **Cavities**. Seal cavity off from roof space.

3.17 FORM OPENINGS

Unless detailed otherwise form openings to typical details from BRANZ Masonry veneer - Good practice guide.

3.18 SEPARATION JOINTS

Provide for wall movements of veneer with control joints to [NZS 4210: 2.10](#) Methods of controlling wall movements. Weatherproof as necessary.

3.19 FORM REVEALS

Form lintels, jambs and sills as detailed complete with flashings and all ready for following work.

3.20 JAMB FLASHINGS

Provide a flexible flashing to jambs of openings in cavity walls, fully lapped with horizontal damp-proof courses at head and sill, in accordance with [E2/AS1, 9.2.4](#), **Flashings**.

3.21 SILL FLASHINGS

Provide a flexible flashing under jointed sills, turned up at back and ends, in accordance with [E2/AS1, 9.2.4](#), **Flashings**.

3.22 REBATE DAMP PROOFING

Provide damp-proof course to stepped rebates supporting brick veneer in accordance with [E2/AS1, 9.2.5](#), **Foundation support and damp-proofing**.

Installation - standard brick veneer**3.23 CAVITY WIDTH**

No cavity width less than 40 mm or more than 75 mm.

3.24 PLACE WALL TIES

Place wall ties to: -

- [NZS 4210: 2.9.5](#) Tie anchorage, cover and fixing; and
- [NZS 4210: 2.9.6](#) Placing of ties
- [NZS 4210: 2.9.7](#) Tie classification and spacing
- [NZBC E2/AS1, 9.2.7](#), **Wall ties**, for requirements, spacing, embedment, placement and materials

At unsupported edges and at all openings through veneered walls or non-grouted cavity walls, wall ties to be provided:

At the top and bottom of the opening:

- Not more than 300 mm or 2 courses, whichever is the smaller

At the sides of the opening or at an unsupported edge:

- Not more than 300 mm
- Where the veneer wall continues above or is interrupted by a damp-proof course or waterproof membrane, wall ties shall be provided in each of the first two courses above the membrane.

Installation - ancillary work**3.25 BUILD IN FIXINGS**

Build in necessary fixing bricks or blocks for trims.

3.26 BUILD IN ELEMENTS

Build in sills, copings, lintels, steps and other elements using mortar similar to that in adjacent walls.

3.27 BUILD IN DOORS AND WINDOWS

Build in door and window frames as the work proceeds and bed in mortar similar to that in adjacent work.

Completion

3.28 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.

3.29 EFFLORESCENCE, WATER CLEANING

To remove deposits, brush with a stiff-bristle broom and take away brushings from the locality. Remove remaining deposit with a damp sponge. Wash wall thoroughly with a plentiful supply of clean water. Repeat this process every 4 weeks from appearance through to the completion of the contract works.

3.30 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

3.31 PROTECTION

Provide the following temporary protection of the finished work:

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4 SELECTIONS

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

Performance - seismic**4.1 DESIGN PARAMETERS - NON SPECIFIC DESIGN - EARTHQUAKE**

Building seismic zone: ~ (refer to [NZS 4210](#))

Materials - general**4.2 FLASHING - SILL**

Location:	As per plans
Brand / type:	self-adhesive flexible lashing tape
Width:	As per plans
Thickness:	0.5 mm (polyethylene)

4.3 FLASHING - JAMB

Location:	As per plans
Brand / type:	bituminous sheet. Not to be used under LOSP treated timber
Width:	As per plans
Thickness:	0.5 mm (polyethylene)

4.4 DAMP-PROOF COURSE (DPC)

Location:	As per plans
Brand / type:	bituminous sheet / strip. Not to be used under LOSP treated timber
Width:	As per plans
Thickness:	1.0 mm bituminous sheet
Application:	2 coats (bitumen-based paint)

Materials - standard brick veneer**4.5 CLAY BRICKS FOR STANDARD BRICK VENEER SYSTEM**

Brand:	Canterbury Clay Bricks
Size:	230mm x 70mm x 76mm
Laying pattern:	stretcher bond
Pointing:	Raked

Components - general**4.6 SILLS**

Brand / type:	Standard brick
Colour:	TBC By Client & Contractor

Components - standard brick veneer

4.7 REINFORCEMENT

Brand / type:	TBC By Client & Contractor
Material:	Galvanized mild steel

4311S STEEL & TUBE PROFILED METAL ROOFING

1 GENERAL

This section relates to the supply and fixing of **Steel & Tube** profiled metal roofing, complete with accessories.

1.1 RELATED WORK

Refer to 7411S STEEL & TUBE 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
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/pre painted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Steel & Tube's literature, including:

Product Guide
Product Technical Statements
Design Solutions
NZ Steel: Specifiers and Builders Guide
NZ Steel: Installers Guide

Copies of the above literature are available from Steel & Tube

Web: www.steelandtube.co.nz

Email: info@steelandtube.co.nz

Telephone: Freephone 0800 333 247

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty in accordance with published supplier's guidance on materials, environments and building types:

15 years minimum	For Perforation
15 years minimum	For coatings

- Provide warranties on Steel & Tube standard **Warranty Plus** format.
- Commence the warranty from the date of installation.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

Warrant this work under normal environmental and use conditions against weatherproofing failure.

5 years: For workmanship

Form: Roofing installers standard form

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

Include a copy of the Steel & Tube maintenance requirements with the warranty.

Refer to the general section 1237 WARRANTIES - INSTALLER/APPLICATOR for additional requirements.

Requirements**1.7 NO SUBSTITUTIONS**

Substitutions are not permitted to any specified Steel & Tube products, or associated components and products.

1.8 QUALIFICATIONS

Roof Installers shall be experienced, competent roofers familiar with Steel & Tube products. And for Restricted Building Work shall also be, an LBP or supervised by an LBP.

Carry out work with experienced, competent installers familiar with the products being used and preferably with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

Performance - Wind**1.9 DESIGN PARAMETERS - NON SPECIFIC DESIGN**

Building wind zone ~ (refer to [NZS3604](#), table 5.4)

1.10 FIXINGS, WIND

Design and use the fixings/fixing pattern appropriate for the wind design parameters and [NZMRM CoP](#). Refer to Steel & Tube Product Technical Statements for the selected profile. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

Performance - General**1.11 PERFORMANCE**

Install roofing material and associated flashings and accessories to form a weather tight and durable system.

1.12 DRINKING WATER

Roofing for collecting potable water to [NZBCG12/AS1](#).

1.13 CO-ORDINATE

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

2 PRODUCTS**Materials****2.1 ALUMINIUM/ZINC ALLOY COATED STEEL, UNPAINTED**

Grade G550 steel sheet coated to AS 1397

Coating class: AZ 150.

Fixings

2.2 FASTENERS GENERALLY

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

2.3 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by the roofing manufacturer and with a minimum Category 4 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm.

2.4 RIVETS

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

Components

2.5 FLASHINGS GENERALLY

To E2/AS1, 4.0, **Flashings**.

Grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, and 0.90mm for aluminium (or 0.7mm for small aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to Steel & Tube's approved recommendations and designs.

2.6 FLASHINGS TO VERGE, RIDGE AND HIP

To E2/AS1, 4.0, **Flashings**.

Supplied by the roofing manufacturer to match or to suit the roofing.

2.7 BOOT FLASHINGS

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

Accessories

2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

Neutral curing silicone or MS polymer sealant as required by Steel & Tube and used as directed.

2.11 CLOSURE STRIPS

Compressible, profiled, closed cell foam strips to fit the sheet profile.

2.12 LAP SEALING TAPE

Closed cell self adhesive Trimseal lap tape.

3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

For transverse flashings the framing moisture content to be a maximum of 18%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

Stack roofing and accessories on clean, level areas of the site and protect from mechanical damage, wind damage and contamination. Loosely cover dry sheeting, with any wet sheeting fillet or cross stack to allow air to circulate. Remove strippable protective film, if applied, prior to prolonged exposure to sunlight.

3.4 HANDLING

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

3.5 SEPARATION

Place isolators between dissimilar metals and separate roofing from treated timber and cement based materials. Do not use unpainted lead sheet or copper in contact with or allow water run-off onto galvanized or Zinalume® materials.

Application

3.6 SET-OUT

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

3.7 END LAPS

End laps are not permitted, except where specifically detailed.

3.8 FIXING GENERALLY

Install and fix in accordance with the [NZMRM CoP](#) requirements, and to Steel & Tube's recommendations. Paint colour matched fixings and accessories before installation.

3.9 MARKING AND CUTTING

Cut only by shearing tools. Do not use black lead pencils for marking aluminium/zinc coated products.

3.10 FIX SHEETS

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

3.11 STOP ENDS AND DOWNTURNS

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

3.12 FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Where no detail is provided flash to [NZMRM CoP](#) recommendations and Steel & Tube's requirements. Cut accurately and fix using sealant and rivets to detail and to Steel & Tube's requirements to form a weatherproof cover. For highly visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.13 USE OF SEALANTS

Select and use sealants only as recommended by Steel & Tube. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

3.14 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar 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.

3.15 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing. Do not fasten transverse flashings to timber with moisture content >18%.

Completion

3.16 REPLACE

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

3.17 LEAVE

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

3.18 REMOVE

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

4 SELECTIONS

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

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

Coating system**4.1 COATING SYSTEM - EXPOSURE ZONE B-C (CAT 1-3)**

Project Exposure Zone B-C to [NZS 3604](#), C 1-3 to ISO 9223.

Profile/location: As per plans (roof)

Base material: Zinalume® on steel

Coating system: Colorsteel Endura

Coating colour: (TBC by client & contractor) 18 years

Roofing**4.2 STEEL & TUBE - CUSTOM ORB, CORRUGATE ROOFING**

BMT/material: 0.4mm Steel

Framing material: Timber

Fixing: 12gx55mm Category 5* Dual Point with neos

Fixing pattern: Refer to Steel & Tube Custom Orb literature for details

Accessories**4.3 FLASHINGS - GENERALLY**

Profile: As per plans

BMT/material: 0.55/Alum/Zinc coated steel:

Coating system: To match roofing

Coating colour: To match roofing

4.4 CLOSURE STRIP

Brand: Ecofoam or pre-notched perforated metal closers

4.5 DEKTITE PIPE FLASHING

Brand/Type: Dektite

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 manufactured by either **Altherm**, **First** or **Vantage**.
It includes:

- APL Residential aluminium windows and doors
- Hardware and furniture
- Flashings and sealants

1.1 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ
WEERS	Window Energy Efficiency Rating System
PQAS	Powder Coating Quality Assurance System

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 F4/AS1	Safety from falling
NZBC H1/VM1	Energy efficiency
NZBC H1/AS1	Energy efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4303	Ventilation for acceptable indoor air quality
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
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 2604.05	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
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1 Amendment 7
PQAS	Powder Coating Quality Assurance System
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

US Federal Specification:

TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Altherm Specifier's Guide

First Specifier's Guide

Vantage Specifier's Guide

Vantage Guide to Fluoraset FP - Selling, Fabricating, Handling, Care and Maintenance

APL Guide to specifying powders and issuing/applying for warranties

APL Window Energy Efficiency Rating System (WEERS) Report Series

Manufacturer/supplier contact details

Company: **APL Window Solutions**

Web: www.altherm.co.nz

www.firstwindows.co.nz

www.vantage.co.nz

www.aplnz.co.nz

Email: specifiersguide@aplnz.co.nz

Telephone:: 07 849 2113

Warranties**1.4 WARRANTY - MANUFACTURER/SUPPLIER**

Provide a material manufacturer/supplier warranty:

5 years:	For fabrication
2 years:	For hardware

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements**1.6 NO SUBSTITUTIONS**

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

1.7 QUALIFICATIONS

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

1.8 COMPLIANCE

Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).

1.9 CERTIFICATION

Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of [NZS 4211](#).

Performance**1.10 PERFORMANCE - WINDOWS AND DOORS**

To [NZS 4211](#), including:

- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

1.11 STRUCTURAL/WEATHER-TIGHTNESS

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

Performance - Wind (design by contractor)**1.12 DESIGN PARAMETERS - NON SPECIFIC DESIGN**

Design the installation to the wind zone parameters of [NZS 3604](#), table 5.1.
Refer to SELECTIONS for wind zone.

Finishes**1.13 CERTIFY COATINGS - POWDER COATING**

Certify on request, compliance with this specification and support with control and sampling records.
Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.
The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2 PRODUCTS**2.1 WINDOWS**

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

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](#), 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components for installation - cavity systems**2.9 STANDARD CAVITY CLOSER**

A device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with [NZBC E2/AS1](#) to the spaces above the window or door.

2.10 SUPPORT BAR

WGANZ extruded aluminium support bar with built in drainage and ventilation to [NZBC E2/AS1](#), and support bar location bracket, to provide continuous support to the window unit. Size to suit cladding type.

Components**2.11 GLAZING GASKETS**

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

2.12 HARDWARE AND FURNITURE

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

2.13 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to [NZBC F4/AS1](#), Table 2, Acceptable opening sizes for barriers.

2.14 FIXING BRACKETS

Designed by manufacturer to specific design.

2.15 WEATHERING/INSTALLATION SEALANT

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

Accessories**Finishes****2.16 DURALLOY POWDER COATED ALUMINIUM**

Polyester powder organic coating in accordance with [WGANZ PQAS](#), AS 3715, and AAMA 2603

3 EXECUTION**Conditions - generally****3.1 DO NOT DELIVER**

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

3.2 UNLOAD WINDOW JOINERY

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

3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE

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

3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 636 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

3.7 ADDITIONAL PROTECTION

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

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS

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

3.9 INSTALLATION FIXING

To [NZBC E2/AS1](#), 9.1.10.8, **Attachments for windows and doors**. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings. Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

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

3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces. Securely fix reveals through aluminium fin.

3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with [NZBC F4/AS1](#) 4.0, Opening windows.

Installation - windows and doors

3.14 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS.

3.15 EXPOSED FIXINGS AND FASTENINGS

Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 304 stainless steel.

3.16 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](#).

3.17 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.

3.18 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to [NZBC E2/AS1:9.1.5 Wall underlays to wall openings](#).
- Full height 20mm jamb battens to [NZBC E2/AS1 figure 72A](#) (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer
- all in accordance with the shop drawings, where applicable.

3.19 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

3.20 INSTALLATION CAVITY CONSTRUCTION

Install to [WGANZ Window Installation Guide](#) details and drawings including WGANZ sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to [NZBC E2/AS1, figure 62\(d\)](#).

3.21 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 scribe width at each end.

3.22 COMPLETE AIR SEAL

To [NZBC E2/AS1:9.1.6 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.

3.23 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing**3.24 SEAL FRAMES ON SITE**

Seal frames to each other and to adjoining structure and finishes, all as required by the window and sealant manufacturer and to make the installation weathertight.. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

3.25 PREPARE JOINTS

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

3.26 BACK UP

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

3.27 SEALANT FINISH

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

Cleaning**3.28 REMOVE TRADE DEBRIS**

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

3.29 TRADE CLEAN

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

Completion**3.30 PROTECTIVE COVERINGS**

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

3.31 REPLACE

Replace damaged, cracked or marked elements.

3.32 PROTECTION

Protect finishes against damage from adjacent and following work.

3.33 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM

In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted to minor surface scratching. Otherwise replace all damaged material.

3.34 SAFETY

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

4 SELECTIONS

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

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

4.1 SUPPLY AND INSTALLATION

Supply and installation of the specified APL aluminium joinery.

Supply: By fabricator

Installation: TBC by contractor

Performance**4.2 THERMAL PERFORMANCE**

R-value: 0.26(as determined from [NZBC H1/VM1](#) or [H1/AS1](#))

4.3 AIR INFILTRATION

For [NZS 4211](#), table 3 **Air infiltration**.

Performance - Wind (design by contractor)**4.4 DESIGN PARAMETERS - NON SPECIFIC DESIGN**

Building wind zone High (refer to [NZS 3604](#), table 5.1)

Finishes - Powder Coating

4.5 DURALLOY - POWDER COATING FINISH

Type:	Polyester organic powder coating
System integrity:	Minimum 10 years film integrity
Thickness:	Average of 90 microns with a minimum of 50 microns
Colour:	refer to window manufacturer's literature
Finish:	check available finishes with manufacturer.

Glazing**4.6 GLASS**

Type/thickness:	Refer to glazing section/s for type and thickness.
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Hardware**4.7 WINDOW HARDWARE**

Window fastener:	TBC by contractor with client
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4.8 DOOR HARDWARE

Locks & handles:	TBC by contractor with client
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4.9 HARDWARE FINISH

Finish:	Powder coat
Colour:	Black

Flashings and Sealant**4.10 FLASHINGS**

Material/type:	colorsteel/0.55
Pattern:	Formed to suit details provided

4.11 WEATHERING SEALANT

Type:	1-part polyurethane moisture curing, elastic joint sealant
Colour:	TBC

Reveals**4.12 TIMBER JAMB REVEALS**

Timber species:	Radiata pine
Grade/treatment:	H3.1
Thickness:	25mm
Reveals:	Grooved for wall linings
Finish:	Paint Finish

Window and door system - RESIDENTIAL**4.13 APL RESIDENTIAL AWNING WINDOW**

Brand/type:	Altherm, First or Vantage RESIDENTIAL Series
Frame type:	Non-thermally broken or Residential Thermal Heart
Fasteners:	Urbo Helix

4.14 APL RESIDENTIAL SLIDING DOOR

Brand/type:	Altherm, First or Vantage RESIDENTIAL Series
Frame type:	Non-thermally broken or Residential Thermal Heart

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
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.

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are: TBC by Contractor

Requirements

1.3 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

1.4 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.

1.5 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](#).

1.6 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

2 PRODUCTS

2.1 GARAGE DOOR

Manufacture to [AS/NZS 4505](#) complete with a compliance label.

2.2 MOTORISED DOOR OPENER

TBC

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

4610MR METRO PERFORMANCE GLASS - RESIDENTIAL GLAZING

1 GENERAL

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

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 RELATED WORK

Refer to [4610MR Metro Performance Glass - Residential Glazing](#)

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in Place
EVA	Ethylene Vinyl Acetate
IGU	Insulating Glass Unit
LSG	Laminated Safety Glass
TSG	Toughened Safety Glass
TLSG	Toughened Laminated Safety Glass
MFG	Metro Frameless Glass

Documents

1.3 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1	Energy Efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
AS/NZS 2208	Safety glazing materials in buildings
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4218	Thermal insulation - Housing and Small Buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223. Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier documents relating to this part of the work:
Metro GlassTech Catalogue & Reference and Guide - 6th edition

Manufacturer/supplier contact details

Company:	Metro Performance Glass
Web:	www.metroglass.co.nz
Email:	info@metroglass.co.nz
Telephone:	0800 65 89 45

Warranties**1.5 WARRANTY - MANUFACTURER/SUPPLIER**

Provide a material manufacturer/supplier warranty:

- | | |
|-----------|---|
| 10 years: | for GlassTech Insulating Glass Units (IGU) |
| 10 years: | for SafeLite Laminated Safety Glass (LSG) |
| 10 years: | for TempaFloat Toughened Safety Glass (TSG) |
| 10 years: | for TempaScreen, TempaClad and TempaPrint digital printed glass |

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

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

Performance**1.6 ENERGY EFFICIENCY**

Provide glazing to meet the energy requirements of [NZS 4218](#) and [NZBC H1/AS1](#) for housing small buildings.

Refer to SELECTIONS and schedules for location and type of glazing.

2 PRODUCTS**2.1 NO SUBSTITUTIONS**

Substitutions are not permitted to any specified Metro Performance Glass, products or systems.

Materials**2.2 TINTED FLOAT GLASS**

Body tinted float glass.

Components, general**2.3 JOINTING, PUTTY AND SEALING MATERIALS**

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Components, aluminium and uPVC glazing**2.4 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.

2.5 SETTING BLOCKS

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

3 EXECUTION**Conditions****3.1 GENERAL REQUIREMENTS**

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

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place.
Comply also with the storage requirements set out in BRANZ BU 636, and [AS/NZS 4666](#) for IGUs.

3.3 GLASS CONDITION

All glass and panes shall have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each pane as required by [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#). Determine the final glass thickness based on whether wind loading or human impact considerations govern.

3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to [NZS 4223.1](#), Section 4 Glazing.

Conditions - human impact safety requirements**3.6 SAFETY GLAZING, GENERAL REQUIREMENTS**

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, for thickness and maximum areas of panel Safety Glass.

3.7 SAFETY GLAZING MATERIAL

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

3.8 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

Assembly**3.9 WORKING OF GLASS**

All working of glass as required in [NZS 4223.1](#).

3.10 EDGE WORK AND BEVELLING

All edges shall be clean cut unless specified in SELECTIONS or as shown on drawings.

3.11 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.12 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

Application aluminium**3.13 INSTALL GLASS TO ALUMINIUM FRAMES**

Install glass to [NZS 4223.1](#).

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

3.14 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

Finishing**3.15 SAFETY**

Indicate the presence of transparent glass for the construction period, with tape or signs compatible with the glass type.

Completion**3.16 TRADE CLEAN**

Remove safety indicators and trade clean at completion of the building as required by the contract documents.

- 3.17 REPLACE
Replace damaged, cracked or marked glass that occurs during glazing.
- 3.18 LEAVE
Leave work to the standard required by following procedures.
- 3.19 REMOVE
Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Performance - wind

- 4.1 WIND ZONE - NON-SPECIFIC DESIGN
Building wind zone: High as determined from [NZS 3604](#), [NZS 4223.4](#) or [NZS 4211](#).

Glass by type

- 4.2 METRO PERFORMANCE GLASS - TINTED FLOAT GLASS

Location:	Window and Door Glazing
Brand/type:	Metro Tinted Float
Tint:	TBC with client
Thickness:	4 mm

4711T TERRA LANA NATURAL WOOL INSULATION

1 GENERAL

This section relates to **Terra Lana** wool and polyester fibre blend insulation, installed, laid, hung or fitted as thermal and acoustic insulation, including:

- ceiling insulation
- wall insulation
- pipe lagging
- for new and retrofit residential, commercial and industrial buildings

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.

The following abbreviations apply specifically to this section:

IIC	impact insulation class
STC	sound transmission class rating

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
NZBC H1/VM1	Energy efficiency
AS/NZS 3000	Electrical installations (Known as the Australian/New Zealand Wiring Rules)
AS/NZS 4859.1:2002	Materials for the thermal insulation of buildings. Part 1 - General criteria and technical provisions
NZS 4218	Thermal insulation - Housing and small buildings
NZS 4243.1	Energy efficiency - Large buildings - Building thermal envelope
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings

[Health and Safety at Work Act 2015.](#)

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Terra Lana Wool Insulation Brochure

[BRANZ Appraisal 682](#) - Terra Lana Wool Insulation

[Marshall Day Acoustics - report on Terra Lana 90mm insulation](#) (R2.2)

Marshall Day Acoustics - report on Terra Lana 60mm insulation 2.8kg/m² (Chatterblock ECO)

Declare certification - [Declare ID: TLW-0001 Terra Lana Wool Blend Insulation](#)

Manufacturer/supplier contact details

Company: **Terra Lana Products Ltd**

Web: www.terralana.co.nz

Email: info@terralana.co.nz

Telephone: 0800 485 262 / (03) 982 0211

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years: For materials (refer Terra Lana for details)

- 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.

Requirements

1.6 QUALIFICATIONS GENERAL

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Terra Lana** systems, or associated components and products.

1.8 RETURNING OFFCUTS TO TERRA LANA FACTORY FOR RECYCLING

After completion of works, the installer/contractor contacts Terra Lana manufacturer/supplier to organise return of any offcuts to the factory for recycling.

2 PRODUCTS

Materials

2.1 TRUSS ROOF INSULATION - SEGMENT / BLANKET

Terra Lana Truss Roof insulation to [NZBC H1/AS1](#), [AS/NZS 4859.1:2002](#), is manufactured from a mixture of clean, recycled fibre from textile mills and new sheep wool. The wool is blended with polyester melt bond fibre and thermally bonded to form a dimensionally stable structure. It varies in colour from light to dark grey. Refer to SELECTIONS for options.

2.2 WALL INSULATION - SEGMENT / BLANKET

Terra Lana Wall insulation to [NZBC H1/AS1](#), [AS/NZS 4859.1:2002](#), is manufactured from a minimum of 50% recycled sheep wool fibre, combined with high performance polyester and melt bond polyester fibres. Refer to SELECTIONS for options.

Components

2.3 WIRE NETTING

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

2.4 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape, stapled over framing to retain insulation in unlined wall, ceiling and underfloor locations.

For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to [NZBC E2/AS1 9.1.8.5](#) **Wall framing behind cavities**.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 HANDLING

No protective clothing is necessary. Maintain full thickness to ensure stated R-value.

3.4 HAZARD & RISK MANAGEMENT

To [Health and Safety at Work Act 2015](#) and take all safety precautions necessary to reduce potential hazards and risks. Refer also to [NZS 4246](#), Appendix B. - Health and Safety.

3.5 INSPECTION

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

Application - general

3.6 PRE-INSTALLATION - GENERAL

Calculate insulation requirements to [NZBC H1/VM1](#) and [NZS 4218](#) climate zones and tables.

3.7 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Allow a clear gap around metal flues as recommended by the fireplace manufacturer. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath. For optimum performance, use within 6-months of the date of manufacture (on the pack label).

3.8 INSULATION CLEARANCE - ROOFING UNDERLAY

Ensure a minimum 25mm clearance is maintained between the insulation and any non rigid roofing underlay.

3.9 INSULATION CLEARANCES FROM HEAT SOURCES - GENERAL

Insulation may need to have a gap to some mechanical and electrical services and equipment, including ducts and chimneys. The gaps should be to the [NZS 4246](#) based tables below or to the equipment manufacturers requirements if they require larger gaps. Smaller gaps to manufacturers requirements can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings). Installed gap not to be more than 50mm bigger than the required gap. The following tables are subject to:

- The requirements of [NZS 4246](#).
- The insulation is exposed to the source of heat or equipment etc.
- Gaps to hot surfaces may have to be increased with non-compliant insulation and plastic/polymeric type insulation (EPS, XPS, PIR, etc), check with insulation manufacturer.
- Gaps to hot surfaces may be able to be reduced with non-combustible insulation, check with equipment manufacturer.
- "Secure insulation" if required means, glue, mechanical fix, or provide fixed barriers at gap edge of insulation to hold in place. Rigid or semi rigid insulation may only need a firm friction fit (secure loose pieces).
- Loose fill insulation will require fixed barriers to [NZS 4246](#) to maintain gaps.

LIGHT FITTINGS

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm(increase if over 100W)	NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Secure insulation.
Recessed, CA 80, CA 90 or CA 135	100mm in all buildings	Ensure insulation complies
Recessed, IC, IC-F or IC-4	100mm in all buildings	Ensure insulation complies
Recessed, marked Do-Not-Cover	Manufacturers clearances	
Independent control gear.	Place on top of insulation and 50mm from fitting.	If not on top allow 50mm clearance to insulation, do not cover. Includes - transformers, ballasts and drivers etc. Maintain clearance by placing guard around control gear, refer to NZS 4246 figure 15.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings and exposed insulation.	200mm	This is exposed insulation to any part of the exposed fitting and bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

INSULATION CLEARANCES TO INBUILT RECESSED HOT APPLIANCES - REFER TO [NZS 4246](#)

INSULATION CLEARANCES FROM EXTRACTS, VENTS, PIPES & ROOF UNDERLAY

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

3.10 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to [AS/NZS 3000](#), 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F & IC-4

Refer to clause INSULATION CLEARANCES GENERALLY for clearances

3.11 RECESSED LIGHT FITTINGS - NON-RESIDENTIAL

Non-residential recessed light fittings to [AS/NZS 3000](#), 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F, IC-4, NON-IC or Do-not Cover

Refer to clause INSULATION CLEARANCES GENERALLY for clearances.

Application - insulation ceiling

3.12 FIT CEILING INSULATION BLANKET - BETWEEN RAFTERS / TRUSS BOTTOM CHORDS

Friction fit **Terra Lana** insulating blankets in place to completely fill the whole of the cavities. Slightly oversize by 5 to 10mm on each edge for friction fit to framing and other batting. Use smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating blankets over the whole of the installation. Refer to SELECTIONS for options. Ensure mesh/vapour barriers are in place, and refer to INSULATION - CLEARANCE TO ROOFING UNDERLAY.

Application - insulation wall

3.13 FIT WALL INSULATION

Friction fit **Terra Lana** insulating segments in place to completely fill the whole of the cavities. Tear across the width of the Fold at dwangs/nogs and the bottom plate aiming to slightly oversize by 5 to 10mm on each edge for friction fit to framing and each other. Rip and fit smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulation over the whole of the installation. Refer to SELECTIONS for options.

Application - components

3.14 LAY WIRE NETTING - UNDER RAFTERS/CEILING BATTENS

Lay at right angles under the rafters/roof joists/ceiling battens. Pull tight and fix.

3.15 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.

Completion

3.16 COMPLETION MATTERS

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

4 SELECTIONS

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

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

4.1 TERRA LANA TRUSS ROOF INSULATION - FOR 900MM FRAMING CENTRES

Location:	As per plans
Brand:	Terra Lana Truss Roof Insulation
R Value:	R4.0
Dimensions:	180mm
Colour:	Grey

4.2 TERRA LANA WALL INSULATION - FOR 600MM CENTRE STUDS

Location:	As per plans
Brand:	Terra Lana Wall Insulation
R Value:	R3.2
U Value	U 0.31
Dimensions:	140mm
Colour:	Grey

5112 FIBROUS PLASTER LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of fibrous plaster sheets and accessories to timber and steel substrates:

- wall linings
- ceiling linings

Related work

Documents

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC C/AS1, C/AS2	Protection from fire
NZBC G6/VM1	Airborne and impact sound
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS/AS 2592	Gypsum plaster for building purposes
ASTM C557-03e1	Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing

New Zealand Fibrous Plaster Association: Code of recommended practice for the application, fixing and specification of fibrous plaster

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.

1.2 MANUFACTURER'S DOCUMENTS

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

~

Copies of the above literature are available from ~

Web: <https://www.healthbasedbuilding.com/>

Email: shane@healthbasedbuilding.co.nz

Telephone: 03 366 4044

Requirements

1.3 QUALIFICATIONS

Fixing and stopping to be carried out by competent workers, experienced in the materials and in the techniques specified and who are members of the New Zealand Fibrous Plaster Association.

2 PRODUCTS

Materials

2.1 STANDARD FIBROUS PLASTER SHEET

Form from gypsum plaster to [NZS/AS 2592](#), casting grade, reinforced with fibreglass or sisal hemp to NZS [AS/NZS 2588](#).

2.2 NAILS

30mm, 40mm and 50mm x 2.5mm galvanized flat head clouts as required for the New Zealand Fibrous Plaster Association standard, fire rated and acoustic systems.

2.3 SCREWS

30mm, 40mm and 60mm x 6 gauge non-rusting gypsum screws as required for the New Zealand Fibrous Plaster Association standard, fire rated and acoustic systems. Washers as required for fire rated systems.

- 2.4 TAPE
Reinforcing type 40mm wide open-weave fibreglass.

Accessories

- 2.5 ADHESIVES
Wallboard: Solvent based wallboard adhesive to ASTM C557-03e1.
Cornice: Water/plaster mix

- 2.6 JOINTING COMPOUND
Finishing grade.

- 2.7 STOPPING PLASTER
Finishing grade gypsum plaster.

3 EXECUTION

Conditions

- 3.1 HANDLE AND STORE
Handle and store sheets and accessories to the sheet manufacturer's requirements.
- 3.2 SUBSTRATE
To the sheet manufacturer's requirements. Plumb, level, in true alignment before commencing work.
- 3.3 PROTECT
Protect joinery, fittings and finishes already in place from water staining or damage.

Application - Standard Systems

- 3.4 FORM REBATES
Form rebates for taping of joints except where joint wadding is specified.
- 3.5 LINE WALLS AND CEILINGS
To [AS/NZS 2589](#). Line walls and ceilings with the various sheets and fix to the New Zealand Fibrous Plaster Manufacturers Association: "Code of recommended practice for the application, fixing and specification of fibrous plaster".

Finishing - stopping

- 3.6 JOINTS
Immerse reinforcing tape in the stopping and after removing excess lay evenly and smoothly across the joints in the sheet rebates. Fill rebates and joint with the stopping plaster and finish off to the sheet manufacturer's requirements.
- 3.7 FILLING
Fill fastening holes, angles and damaged arrises with stopping plaster and flush off to the sheet manufacturer's requirements.

Completion

- 3.8 REPLACE
Replace damaged sheets or elements.
- 3.9 CLEAN DOWN
Clean down completed surfaces to remove irregularities and finally finish to the sheet manufacturer's requirements to leave completely smooth and clean.
- 3.10 LEAVE
Leave work to the standard required by following procedures.

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

4 SELECTIONS

Standard systems

4.1 FIBROUS PLASTER CEILING SHEETS

Type	Thickness	Fixing	Location
Standard	9mm	Fortress Fasteners 6g x 32mm C3 Galvanised Collated Screws c	All ceilings

4.2 FIBROUS PLASTER WALL SHEETS

Type	Thickness	Fixing	Location
Standard	9mm	Fortress Fasteners 6g x 32mm C3 Galvanised Collated Screws c	All internal walls
Water resistant	Refer to supporting docs		

5113 PLASTERBOARD LININGS

1 GENERAL

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

- standard systems
- bracing systems

1.1 RELATED SECTIONS

Refer to ~ for ~

1.2 ABBREVIATIONS

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

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.3 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC C/AS1, C/AS2	Protection from fire
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3602	Timber and wood based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	Cold-formed steel structures

ASTM C630/C630M-96a Water-resistant gypsum backing board

BRANZ Technical Paper P21 Technical Paper P21: A wall bracing test and evaluation procedure (2010)

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

1.4 MANUFACTURER'S DOCUMENTS

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

~

Copies of the above literature are available from ~

Web: <https://www.healthbasedbuilding.com/>

Email: enquiries@healthbasedbuilding.co.nz

Telephone: 03 366 4044

Requirements

1.5 QUALIFICATIONS

Plasterboard fixers and stoppers to be experienced competent workers, familiar with materials and techniques specified. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.6 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:

- before applying sealer and
- before applying finish coatings or decorative papers,

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

Performance - systems**1.7 BRACING REQUIREMENTS**

Provide braced wall systems using bracing rated plasterboard sheet to meet the requirements of [NZS 3604](#), section 5, **Bracing design**, when tested in accordance with BRANZ Technical Paper P21.

2 PRODUCTS**Materials****2.1 GYPSUM PLASTERBOARD**

Gypsum plaster core encased in a durable face and backing paper formed for standard use to [AS/NZS 2588](#).

2.2 GYPSUM PLASTERBOARD, HIGH FINISH SYSTEMS

Gypsum plaster core encased in a special fine surface durable face and backing paper formed for standard and fire rated use to [AS/NZS 2588](#).

2.3 GYPSUM PLASTERBOARD, WALL BRACING SYSTEMS

Gypsum plaster core encased in a durable face and backing paper bracing rated sheet to [AS/NZS 2588](#).

2.4 CORNICE

Plasterboard, scotia pattern.

Components**2.5 CEILING BATTENS, METAL**

0.55mm galvanized steel (275 g/m² zinc coating) battens and matching perimeter channels.

2.6 SCREWS, TIMBER FRAME

9mm plasterboard: Fortress Fasteners 6g x 32mm C3 Galvanised Collated Screws collated

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.7 SCREWS, STEEL FRAME / BATTENS

9mm plasterboard: Simpson Strong Tie 8g x 32mm C3 Galvanised Wing Tip Collated #2 Square Drive Screws

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.8 SECTIONS AND TRIM MATERIAL

Form from galvanized steel of a coating class not less than ZM275 to AS 1397 and fix with 30mm x 2.5mm galvanized clouts.

2.9 EXTERNAL ANGLE

Perforated.

2.10 INTERNAL REINFORCING ANGLE

Perforated.

2.11 CONTROL JOINT

With plastic protective tape.

2.12 CASING BEAD

To suit sheet thickness.

2.13 J MOULD

Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25mm x 1.6mm nickel panel pins.

- 2.14 TAPE ON EDGE TRIMS
Tape-on paper tape and galvanized steel trims and edges.

- 2.15 EDGE PROFILES
Pre-formed aluminium profiles, with perforated edge trims.

Accessories

- 2.16 ADHESIVE
Multi-purpose water based wallboard adhesive.

- 2.17 JOINTING COMPOUNDS
System match bedding compound and finishing compound. Refer to the sheet manufacturer's literature and follow their requirements on which compounds to use with which accessory and in which location, to achieve the required level of finish.

- 2.18 JOINTING TAPE
System match reinforcing tape.

Finishes

- 2.19 SKIMCOAT PLASTER
Proprietary spray-on surface finish.

3 EXECUTION

Conditions

- 3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
- 3.2 ROUTINE MATTERS
Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.
Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.
- 3.3 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 plasterboard prior to the application of a range of decorative finishes under various lighting conditions. Refer to [AS/NZS 2589](#).
- 3.5 SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements.
- 3.6 TIMBER FRAME MOISTURE CONTENT
Maximum allowable moisture content to [AS/NZS 2589](#) for timber framing at lining is 18% or less for plasterboard linings.
- 3.7 PROTECTION
Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.8 GENERAL REQUIREMENTS

Leave a 10mm gap at floor level. Do not break the face paper. Position sheets to a "touch fit" with no forcing or springing into place. Run sheets over doors and under and over window openings. Apply adhesive in daubs 25mm diameter and 10mm thick. Do not place daubs at sheet perimeters or under nail and screw fixings.

Application - fixing

3.9 INSTALL CEILING BATTENS

Install in accordance with the batten manufacturer's requirements.

3.10 LINE CEILINGS AND WALLS

Line ceilings and walls with the various sheets and fix to the sheet manufacturer's details and requirements, using tapered edge joints as far as possible.

3.11 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.12 END BUTT JOINTS

When end butt joints are unavoidable, locate staggered off the framing, back block, fix and stop to the sheet manufacturer's details and requirements.

Application - bracing systems

3.13 LINE BRACING WALLS

Line walls with high density plasterboard sheet to form panels or systems, clout-washer and clout fixed to the sheet manufacturer's details. Do not fix bracing sheets until steel bracing and/or straps are in place.

Application - finishing sections and trim

3.14 FIX EXTERNAL ANGLE

Fix full length to external corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.15 FIX INTERNAL REINFORCING ANGLE

Fix full length to internal corners with clouts at 100mm centres each side staggered to the sheet manufacturer's details and requirements.

3.16 FIX CASING BEAD

Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.

3.17 FIX J MOULD

Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.

3.18 FORM CONTROL JOINTS

Provide at maximum 9 metre centres in long unbroken walls and 12 metre centres to ceilings to the sheet manufacturer's details and requirements. Fix control joint section into joint by staples at 150mm both sides. Fill gap in voids with sound rated sealant. Remove plastic tape after stopping.

3.19 FIX COVER MOULDS

Fix to the sheet manufacturer's details and requirements and to the drawings supplied.

3.20 FIX CORNICE

Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements

3.21 FORM SQUARE STOPPED CORNERS

Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.

3.22 INSTALL TAPE-ON TRIMS

Install in accordance with the trim manufacturer's requirements.

3.23 INSTALL SPECIAL EDGES AND BANDS

Install in accordance with the edging manufacturer's requirements.

Finishing - stopping**3.24 FORM JOINTS**

Fill recess with bedding compound, centre the reinforcing tape, apply a second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off, to the sheet manufacturer's details and requirements.

3.25 STOPPING NAILS AND SCREWS

Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.

3.26 SQUARE STOPPED CORNERS

Fill with bedding compound, centre reinforcing tape into internal angle and apply a coat of finishing compound and complete to the sheet manufacturer's details and requirements.

3.27 EXTERNAL ANGLES

Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.

3.28 END BUTT JOINTS

Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

3.29 APPLYING SKIMCOAT PLASTER

Apply spray-on surface finish in accordance with the sheet manufacturer's requirements.

Completion & Commissioning**3.30 COMPLETION MATTERS**

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

4 SELECTIONS**4.1 PLASTERBOARD LININGS - STANDARD SYSTEMS - WALLS**

Location: As per plans

Type/thickness: 9mm Magnum Board

4.2 PLASTERBOARD LININGS - STANDARD SYSTEMS - CEILINGS

Location: As per plans

Type/thickness: 9mm Magnum Board

4.3 PLASTERBOARD LININGS - BRACING SYSTEMS

For bracing element location refer to drawn documentation.

Accessories**4.4 CEILING BATTENS**

Brand/type: GIB Rondo Metal Battens

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
[AS/NZS 2455.1](#) Textile floor coverings - Installation practice - General

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Warranties

1.3 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.

1.4 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

1.5 QUALIFICATIONS

Carpet layers to be experienced, competent trades people familiar with the materials and the techniques specified, and with [AS/NZS 2455.1](#).

1.6 MOISTURE CONTENT OF CONCRETE SLAB

Concrete slab is to 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.

1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.8 NO SUBSTITUTIONS

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

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

To [AS/NZS 2270](#).

Timber/plywood with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

Accessories**2.6 TAPE**

To carpet manufacturer's requirements.

3 EXECUTION**Conditions****3.1 DELIVERY**

Take delivery of materials and goods and store on site and protect from damage.
Accept rolls of carpet and accessories undamaged and dry.

3.2 HANDLE AND STORE

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.

3.3 INSPECTION

Before starting work inspect the substrate to ensure that it will allow work of the required standard, and that all fittings and fixtures around which the carpet is to be scribed are in place.

3.4 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.5 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.

3.6 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.

3.7 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

3.8 FLOOR PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION. Prepare floor and check conditions required for laying to [AS/NZS 2455.1](#), section 2.

Application - substrate preparation**3.9 PREPARING NEW CONCRETE FLOOR**

To be level, smooth, clean, cured and dry. Remove loose material and dust. Refer to 6192 FLOORING SUBSTRATE PREPARATION.

Application - carpet laying**3.10 INSTALLATION, UNDERLAY**

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.11 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.

3.12 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**3.13 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.

3.14 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

3.15 PROTECTION

Provide the following temporary protection of the finished work:

3.16 SPECIAL PROTECTION

Self Adhesive carpet protective film: ~

4 SELECTIONS

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

4.1 UNDERLAY

Location	Brand	Type/thickness/weight
Floor	High density bonded polyurethane foam (PBF)	7mm

4.2 CARPET

Location	Brand/type/weight/code	Installation method
TBC	TBC	TBC

Spares & maintenance products

6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Guidelines for the management of lead-based paint
MPNZA	Specification manual
MPNZA	Health and Safety Programme
Health and Safety at Work Act 2015	

Requirements

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.6 HEALTH AND SAFETY

Refer to the requirements of the [Health and Safety at Work Act 2015](#) and [WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry](#). If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to [WorkSafe NZ: Guidelines for the management of lead-based paint](#) for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.7 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties**1.8 WARRANTY**

Warrant this work under normal environmental and use conditions against failure.

2 years: Warranty period

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

Performance**1.9 MANUFACTURER'S INSPECTION**

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.10 INSPECTION OF WORK

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

2 PRODUCTS**Materials****2.1 PAINT TYPES**

Use the manufacturer's complete system and only the products specified.

2.2 MATERIALS GENERALLY

Use only the Manufacturer's products which are guaranteed for their consistency and performance under [AS/NZS ISO 9001](#) and APAS approval, prepared, mixed and applied as directed in the Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

Accessories**2.4 FILLERS**

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified coating.

3 EXECUTION**Conditions****3.1 EXECUTION**

To conform to manufacturer's requirements and those methods, practices and techniques contained in [AS/NZS 2311](#), the MPNZA Specification manual, and [WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry](#).

3.2 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.3 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.4 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.5 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.6 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.7 TREATED SURFACES

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

3.8 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior

For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.

Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior

For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.

Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.9 ANCILLARY SURFACES

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

3.10 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.11 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products**3.12 MOISTURE CONTENT**

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.13 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.14 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.15 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.16 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.17 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.18 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.19 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping.

Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - painted surfaces generally**3.20 SURFACE PREPARATION**

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.21 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water.

Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.22 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty.

Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Application - before applying final coatings**3.23 OFF-SITE WORK**

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.24 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated.

Liberal coat end grain, allow to soak in and then recoat. Ensure LOSP. treated joinery has dried sufficiently to lose odour.

3.25 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.26 CONCEALED METAL SURFACES

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

3.27 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.28 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.29 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally**3.30 PAINTING GENERALLY**

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.31 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.32 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.33 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.34 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of the paint manufacturer and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.35 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

3.36 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.37 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.38 EACH COAT

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

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

Completion

3.39 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

3.40 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal.

3.41 LEAVE

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

3.42 REMOVE

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

3.43 REPLACE HARDWARE

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

4 SELECTIONS**4.1 SELECTIONS**

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

7123 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC C/AS1-AS2	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1	Energy Efficiency
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe fittings - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1: 2018	Plumbing and drainage - Water services
AS/NZS 3500.4: 2018	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4607	Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617	Tempering (3-port mixing) valves
AS/NZS 5601.1	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.
Gas (Safety and Measurement) Regulations 2010	
Plumbers, Gasfitters and Drainlayers Act 2006	
NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2011, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.3 WARRANTY

Provide warranty for:

2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

1.5 PIPEWORK LAYOUTS

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1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.7 HOT WATER TEMPERATURES

To [NZBC G12/AS1](#), 6.14

Storage water heaters to store water at not less than 60°C.

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:

- 55°C - 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](#), 7.5, **Watertightness**, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

Materials

2.1 POLYETHYLENE PIPE

To [AS/NZS 4130](#) Series 1 complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), table 1 and [NZBC G12/AS1](#), table 1. Except for solid black PE, protect from sunlight.

2.2 CROSS LINKED POLYETHYLENE PIPE

Cross Linked Polyethylene Pipe to [AS/NZS 2492](#) and fittings to [AS/NZS 2537.2](#) with a minimum pressure capability of 1200 kPa complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), table 1 and [NZBC G12/VM1](#). Except for solid black PE-X, protect from sunlight.

2.3 TEMPERING VALVE

Tempering valve to [NZS 4617](#) to [NZBC G12/AS1](#).

2.4 HEADER TANKS

Pre-formed black polyethylene or stainless steel tank, complete with access opening and lid and overflow tray.

Materials - Hot water heating appliances**2.5 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE**

To [NZS 4305](#), ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

Components**2.6 INSULATION**

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to [NZBC H1/AS1](#).

2.7 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

3 EXECUTION**3.1 EXECUTION GENERALLY**

Generally carry out the whole of this work and tests to [NZBC G12/VM1](#) or [NZBC G12/AS1](#).

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

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

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in [NZBC G12/AS1](#), table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing**3.10 JOINTING POLYETHYLENE PIPE**

Seal ring compression joints and electrofusion to [NZBC G12/AS1](#).

Application - Pipework installation**3.11 POTABLE WATER SUPPLY PIPEWORK INSTALLATION**

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.12 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.

Lag all pipes with rigid insulation to the manufacturer's requirements and [NZBC G12/VM1](#) or [NZBC G12/AS1](#).

3.13 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to [NZBC G12/AS1](#), 9.0.

3.14 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.

3.15 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Hot water systems**3.16 HOT WATER CYLINDER INSTALLATION GENERALLY**

Install hot water cylinders complete to the manufacturer's requirements and to [NZBC G12/AS1](#), 6.11, Water heater installation. Valve-vented systems to [NZS 4607](#).

3.17 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and [NZBC G12/AS1](#), 6.11, Water Heater Installation.

3.18 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to [NZBC H1/AS1](#) 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.

3.19 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with [NZBC G12/AS1](#): 6.11. Valve-vented systems to [NZS 4607](#).

3.20 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to [NZBC G12/AS1](#).

3.21 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

Installation - valves**3.22 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.

3.23 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or [NZ Backflow Testing Standard](#).

Completion**3.24 LABEL**

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.25 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.26 REPLACE

Replace damaged or marked elements.

3.27 LEAVE

Leave work to the standard required by following procedures.

3.28 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS**Pipework****4.1 POLYETHYLENE PIPE**

Size: 25mm outside diameter (i.e. DN 25 in [AS/NZS 4130](#))

4.2 EXPOSED PIPES

Type: white polyethylene composite pipe

Accessories: stainless steel hose braid fitted with stainless steel nuts

Manufacturer: TBC

Brand: TBC

4.3 PIPEWORK INSULATION

Brand: TBC with Plumber

Material: polyurethane

Wall thickness: 90mm & 140mm

Finish: Plain

Hot water systems**4.4 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE**

Brand: TBC with Plumber

Model size: 250L

Valves and accessories

- 4.5 FLOOR/ZONE ISOLATING VALVES
Location: Garage
Brand/type: TBC with Plumber
- 4.6 APPLIANCE ISOLATING VALVES - CONCEALED
Appliance: TBC with Plumber
Brand/type: TBC with Plumber
- 4.7 APPLIANCE ISOLATING VALVES - EXPOSED
Appliance: Washing machine
Brand/type: Refer to tapware selections
- 4.8 TEMPERING VALVE
Location: HWC
Brand/type: TBC with Plumber
- 4.9 IN-LINE FILTER
Location: HWC
Brand/type: TBC with Plumber

7411S STEEL & TUBE RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Steel & Tube** rainwater disposal systems including spouting and downpipes, in metal.

1.1 RELATED WORK

Refer to 4311S STEEL & TUBE PROFILED METAL ROOFING for metal roofing.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

NZMRM CoP NZ Metal Roof and Wall Cladding Code of Practice

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Steel & Tube's literature, including:

Product Guide
Product Technical Statements
Design Solutions

NZ Steel Specifiers and Builders Guide
NZ Steel Installers Guide

Copies of the above literature are available from:

Web: www.steelandtube.co.nz
Email: info@steelandtube.co.nz
Telephone: 0800 333 247

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 workers, familiar with the materials and the techniques specified.

Performance

1.7 TEST

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

2 PRODUCTS

Materials

2.1 SPOUTING
Complete with matching brackets 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 SPOUTING BRACKETS
All exposed brackets to be colour matched before installation. Brackets to be hot-dipped galvanised or zincalume. No electroplated components are acceptable.

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

2.5 SEALANT
Steel & Tube MS Polymer sealant.

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 fascias, barge or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

3.3 THERMAL MOVEMENT
Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 18 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 - steel

3.5 INSTALL STEEL SPOUTING
Establish minimum falls necessary (minimum 1:500, 2mm in 1 metre) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible the centres should be reduced to 600mm and snow strap fitted. Lap spouting joints a minimum of 40mm and seal with Steel & Tube MS polymer 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 seal and rivet around the joint. All installations to conform to [NZMRM CoP](#) recommendations, section 5, **Roof Drainage**.

3.6 INSTALL STEEL DOWNPIPES
Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the storm water gully or pipe inlet. All installations to conform to [NZMRM CoP](#) recommendations section 5, **Roof Drainage**.

Application - copper

Application - general

3.7 INSTALLATION GENERALLY

Install to [NZMRM CoP](#) recommendations where not otherwise specified.

3.8 INSTALL VALLEY GUTTERS

Attach valley gutters to valley boards by clips allowing for thermal movement to [NZMRM CoP](#), clause 5.6, **Valley Gutters**. Separate valley gutter from valley boards with a layer of roofing underlay.

3.9 INSTALL SECRET GUTTERS

Install secret gutters to fall allowing for thermal movement [NZMRM CoP](#), clause 5.5.7, **Secret Gutters**. Rivet and seal joints with MS Polymer sealant.

Completion**3.10 REPLACE**

Replace damaged or marked elements.

3.11 LEAVE

Leave the whole of this work discharging completely and freely into the storm water system and free of all debris. Leave work to the standard required by following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 STEEL & TUBE SPOUTING

Profile: Quad
Size: 100mm
Base material: Coated steel grade G300 Zinalume
BMT: 0.55mm
Coating system: Colorsteel Endura
Steel & Tube colour: TBC with client & Contractor

4.2 STEEL & TUBE DOWNPIPES

Profile:
Size: 80mm
Base material: Coated steel grade G300 Zinalume
BMT: 0.55mm
Coating system: Colorsteel Endura
Steel & Tube colour: TBC

Stainless steel system

7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1254	PVC-U pipes for storm water and surface water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to [AS/NZS 1260](#) complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.
White polybutylene or PVC, including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to [NZBC G13/AS1](#) and [NZBC G1/AS1](#) and complete all tests to G13/AS1, 7.1 **Test Methods**.

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 INSTALL TRAPS, WASTE AND VENT PIPES - NZBC G13/AS1

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to [NZBC G13/AS1](#) and [AS/NZS 2032](#). Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.5 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS1](#) or [AS/NZS 3500.2](#), 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.6 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS**4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES**

Brand/type: TBC

4.2 EXPOSED PIPES AND TRAPS

Brand/type: TBC

7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC E1/VM1	Surface water
NZBC G13/AS2	Foul Water
NZBC G13/AS3	Plumbing and Drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
Plumbers, Gasfitters and Drainlayers Act 2006	

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to [NZS 3104](#).

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to [AS/NZS 4671](#).

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to [AS/NZS 1254](#) and [AS/NZS 1260](#). Underground PVC-U pipe to be Classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 GULLY TRAPS - NZBC G13/AS2

To [NZBC G13/AS2](#): 3.3 Gully traps, complete with grating.

2.5 INSPECTION COVERS

Cast iron frame with screw-down cover.

2.6 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1

Bedding:	Clean granular non-cohesive material with a maximum particle size of 20 mm.
Bedding & surround:	Clean granular non-cohesive material with a maximum particle size of 20 mm.
Compacted selected fill:	Any Fine grain soil or granular material which is free from topsoil and rubbish and has a maximum particle size of 20 mm.
Ordinary fill:	Excavated material.
Concrete:	75 mm thick concrete pad.

3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs. Trenches running parallel, below and close to foundations of buildings to [NZS 3604](#) or [NZS 4229](#) to be separated to:

- [NZBC E1/AS1](#), 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
- [NZBC G13/AS2](#), 5.6, **Proximity of Trench to Building**, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 DRAINAGE GENERALLY - NZBC G13/AS2 & NZBC E1/AS1

Carry out foul water drainage work to [NZBC G13/AS1](#) and [NZBC G1/AS1](#) and complete all tests to [NZBC G13/AS1](#), 7.1 Test Methods.

Carry out stormwater drainage work to [NZBC E1/AS1](#), and complete all tests to [NZBC E1/VM1](#), 8.0 Drain Leakage Tests.

Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#), [AS/NZS 2566.1](#) and [AS/NZS 2566.2](#).

Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#) and [AS/NZS 2566.1](#).

3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.5 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to [NZBC G13/AS2](#), 3.3 Gully traps.

3.6 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system. Stormwater drain to Soakpit.

3.7 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.

3.8 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed.

Test to [NZBC G13/AS1](#) or [AS/NZS 3500.2](#), 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Carry out stormwater drainage work to [NZBC E1/AS1](#), and complete all tests to [NZBC E1/VM1](#), 8.0 Drain Leakage Tests.

3.9 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL

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 using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg.

4 SELECTIONS

4.1 PVC-U PIPES

4.2 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1

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

Documents

1.2 DOCUMENTS

Documents referred to in this and the above sections are:

NZBC G13/AS2	Foul water
NZBC G13/AS3	Foul water
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

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work are to be supplied by drain layers and plumber to main contractor.

Performance

1.4 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS2,6.1](#) or [AS/NZS 3500.2](#), 15 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 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

2.3 GULLY TRAPS - NZBC G13/AS2

Gully traps complete with grating to [NZBC G13/AS2](#), 3.3 **Gully traps**.

2.4 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.

Accessories**2.5 BEDDING, SURROUND AND FILLING MATERIALS**

Granular: Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.

Selected: Fine grain soil or granular material suitable for bedding and excluding topsoil, organic matter and rubbish.

Ordinary: Top soil or other excavated materials excluding organic matter and rubbish.

2.6 CONCRETE

To [NZS 3104](#).

Prescribed mix 17.5 MPa: For in situ bases, anchors and pipe surrounds.

Prescribed mix 14 MPa: For bedding only.

3 EXECUTION**Application****3.1 BEDDING - NZBC G13/AS2**

Place to [NZBC G13/AS2](#), 5.0 **Installation**, figure 7, **Bedding and backfilling**, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

3.2 SURROUND AND BACKFILL - NZBC G13/AS2

Place to [NZBC G13/AS2](#), figure 7 **Bedding and backfilling**, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

3.3 SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

3.4 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.

3.5 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.

3.6 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**3.7 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**.

3.8 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.

Application - connections**3.9 CONNECTION TO FOUL WATER - PUBLIC MAINS**

Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.

3.10 CONNECTION TO FOUL WATER - PUBLIC MAINS ACCESS CHAMBER

Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

4 SELECTIONS**4.1 GULLY TRAPS**

Manufacturer: TBC
Material: Upvc in case in concrete
Type: TBC

4.2 INSPECTION CHAMBERS - NZBC G13/AS2

Diameter: 80mm
Type: UPVC

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	Structure
NZBC B2/AS1	Durability
NZBC C/AS1	Fire safety
NZBC E2/AS1	External moisture
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
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:

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Copies of the above literature are available from:

Web: <https://www.masportheating.co.nz/en-nz>

Telephone: 0800 666 2824

Warranties

1.4 WARRANTY - INSTALLER

Provide the installer's warranty for the installation, to the project administrator.

~ 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.

1.5 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 ~

Provide this warranty in the approved manufacturer'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:

~

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 1 Durability requirements of nominated building elements.

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 $\geq 65\%$), 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 $\geq 65\%$), 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](#).

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)

Location:	As per plans
Manufacturer:	Masport
Model:	R3000
Authorisation:	191126

Components & Accessories

4.2 FLUE KIT

Manufacturer: TBC
Material: 316 stainless steel
Thickness: 0.52 mm
Height above roof: As per plans
Flue dia: 150mm diameter
Outer shield dia: 200mm diameter
Ceiling plate: Galv, painted to match ceiling

4.3 FLOOR PROTECTOR

Location: As per plans
Manufacturer: TBC
Size: TBC
Finish: Ceramic Tiles

7673 SPLIT UNIT HEAT PUMP SYSTEMS

1 GENERAL

This section relates to heat pump air conditioning systems.

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

1.3 DOCUMENTS

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

NZBC E2/AS1	External Moisture
NZBC G4/AS1	Ventilation
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

1.4 MANUFACTURER'S DOCUMENTS

Manufacturer's documents relating to work in this section are:

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Copies of the above literature are available from:

Web: ~

Email: ~

Telephone: ~

Facsimile: ~

Warranties**1.5 WARRANTY - INSTALLER/APPLICATOR**

Installer's warranty for the system under normal environmental and use conditions against failure.

~ years Execution warranty

Provide this warranty on the installer's standard form.

1.6 WARRANTY - MANUFACTURER/SUPPLIER

Manufacturer's warranty for the system under normal environmental and use conditions against failure.

~ years: Warranty

Provide this warranty on the manufacturer's standard form.

Requirements**1.7 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.

1.8 DRAWINGS AND BROCHURES

Submit, on request for review drawings and brochures of units, grilles and any other elements that affect the interior finishes.

1.9 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.

1.10 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

1.11 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 $\pm 1.5^{\circ}\text{C}$ 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 Type: ~
shading:

Internal window Type: ~
shading:

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.

1.12 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

1.13 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.

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.

3.9 INSTALLATION REFRIGERANT

The completed system including all pipework, to be evacuated to 0.2mm Hg or better with a vacuum pump and maintained at this pressure for 2 hours, then broken with refrigerant.

Completion**3.10 COMMISSIONING**

Commission the systems to manufacturer's recommendations using instruments calibrated in the last 12 months. Submit signed commissioning check list on completion.

3.11 CLEANING

Clean filters, outdoor coils, grilles and diffusers.

Remove debris, unused materials and elements from the site. Clean soiled or marked work.

Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

3.12 PROTECT

Protect new work from damage.

4 SELECTIONS**4.1 SPLIT UNIT HEAT PUMP MANUFACTURER / MODEL**

Manufacturer: Daikin

Indoor Unit Model: Daikin FTXM46UVMZ 'Inverter' Cora 7.3kW Heat Pump

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:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
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 F7/AS1	Warning systems
NZBC G4/AS1	Ventilation
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)
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms
NZS 4514	Interconnected smoke alarms for houses
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 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
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 4 April 2016)	
TCF Premises Wiring Code of Practice 2011	

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are to be provided to the Main contractor

Warranties

1.4 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year: Warranty period

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

Requirements

1.5 COMPLY

Comply with the Electricity (Safety) Regulations 2010, [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and TCF Premises Wiring Code of Practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.6 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

1.7 QUALIFICATIONS - SECURITY SYSTEM

Installation by an installer licensed under the Private Investigators and Security Guards Act. Installation of all security equipment to comply with [AS/NZS 2201.1](#) Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance.

1.8 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 Electrical (Safety) Regulations (2010), regulation 58.

1.9 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

1.10 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 as required by regulation 70.

1.11 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

2 PRODUCTS**2.1 MAINS SUPPLY**

Tough plastic sheathed neutral screened cable to [AS/NZS 5000.2](#) and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to [AS/NZS 5000.2](#), stranded above 1.0mm², and to [AS/NZS 3008.1.2](#). Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm ² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm ² on 16 amp MCBs
Power circuits:	2.5mm ² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm ² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm ² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm ² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres

Range/oven/hob circuits:	Single phase: 6mm ² high temperature cable on 32 amp MCBs
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Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.3 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.

2.4 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.

2.5 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.

2.6 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.

2.7 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. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.

2.8 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.

2.9 SMOKE ALARMS

Type 1 domestic smoke alarm to [NZBC F7/AS1](#). **1.2 Descriptions of alarm systems.** Alarm to AS 3786. A wired 230 volt ionised smoke detector type.

2.10 SURGE PROTECTION

Protection for the homes appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.

2.11 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.12 DOOR BELL SYSTEM

Complete with transformer for mounting on distribution board.

2.13 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.

2.14 RESIDENTIAL RECESSED LIGHT FITTINGS

Residential recessed luminaires to [AS/NZS 60598.2.2](#), types IC-F, IC, CA-80 or CA-135 only.

2.15 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to [NZBC G4/AS1](#), and compliant with [AS/NZS 60335.1](#).

2.16 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 60335.1](#), scratch resistant powdercoated or chrome finish.

2.17 OUTDOOR SWITCHES & SOCKETS

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.

Security system**2.18 CONTROL PANEL**

Control panel system with a minimum of one installer code, one master code, 6 zones minimum and 6 user codes. The installer to select codes to suit installation.

2.19 DETECTORS

There are two main types of detectors:

- Standard passive infrared sensors: Install in stable environments with no wind flow and no direct bright sunlight.
- Passive infrared/ microwave sensors: Install in area where environmental stability is an issue.

2.20 AUDIBLE DEVICES

Internal sirens can be either a 12V Piezo Siren or a Horn speaker with a sound pressure level of no less than 95dB.

External siren can be either a stainless steel design or have hardened plastic casing. Both designs to be fully weatherproof but not limited to IP66 Rating. The siren box to contain a strobe diffuser in either blue or red. The siren shall contain a horn speaker, 12v speaker or an electronic siren. The external siren box to have both a cover and rear wall tamper mechanism.

2.21 CABLING

Security alarm wiring to NZS/AS 1125 for cables.

Security alarm wiring to be multi stranded and not single stranded, minimum 0.5mm².

2.22 PERIPHERALS

Fit anti-tamper devices to detectors, control panels and equipment housings, programmed to give a tamper indication when the system is unset and a tamper alarm when the system is set.

Standard keypad manufactured of moulded hardened plastic with either a LED or LCD screen, to match the style of the wiring accessories in diameter, colour and aesthetics.

2.23 COMMUNICATIONS

Digital dialler to be built into the PCB of all control panels, with the options for both monitoring and remote dial in windows based software. Digital dialler to comply with all the industry standard communication formats including contact I.D and SIA, and NZ Telepermit certification.

Remote software able to upload / download programming changes and or history events and change status of the security alarm with the ability to be turned off if required.

3 EXECUTION**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's and Electricity Retailer's 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's 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/NZS3000 to protect each final sub circuit.

3.5 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to [AS/NZS 3000](#), the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

3.6 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.

3.7 EARTH LEAKAGE PROTECTION

Install RCD protection to [AS/NZS 3000](#).

3.8 RCD - DOMESTIC 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](#).

3.9 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.

Install fixed wired RCD protected outlets (SRCD) in the following 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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.

3.14 SWITCH AND SOCKET UNITS

Fit all single and double switch units, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000mm above finished floor

Socket Units: 150mm above work benches

400mm above finished floor

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.

3.15 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.16 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

3.17 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's 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](#).

3.18 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;

The clearance between insulation and recessed downlights;

- Leave 100mm gap to [AS/NZS 3000](#), figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F.
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

3.19 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's requirements. Fit neatly and without damage to the surrounding finish.

3.20 SURGE PROTECTION

Install surge protection devices to manufacturer's 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.

3.21 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.22 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](#).

3.23 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with [AS/NZS 3000](#) and in accordance with the manufacturer's 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 to IP56, and sockets to IP53 as a minimum. Install to manufacturer's 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.

3.24 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.

Security system**3.25 SECURITY SYSTEM**

Install to the system manufacturer's requirements, control panel, detectors and associated equipment fitted neatly and without damage to surrounding finishes. Installation of security equipment to [AS/NZS 2201.1](#) Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance. All 230v mains power connections to the security panel are to be in accordance with [AS/NZS 3000](#). The 230V power is to be switched using a dedicated single gang Isolator switch or similar.

Completion**3.26 COMPLETION**

Leave installation operating correctly, with equipment clean and operational.

4 SELECTIONS**Materials****Outlets - fittings**