

Approved Building Consent Documents

Please Note: A copy of the stamped approved documents must be available on site for all inspections.

INSPECTION BOOKING TIMEFRAMES			
Telephone 03 347 2839			
Call received	<i>Before 3pm inspection will be done</i>	<i>After 3pm inspection will be done</i>	
Monday	Wednesday	Thursday	Thursday
Tuesday	Thursday	Friday	Friday
Wednesday	Friday	Monday	Monday
Thursday	Monday	Tuesday	Tuesday
Friday	Tuesday	Wednesday	Wednesday

SPECIFICATION

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

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(project name)

Lot 31 Hinterland Drive, The Woods, Prebbleton, New Zealand

(project address)

First Homes

(client)

Project Ref: 42-2016

Date: 20 January 2017

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1220 PROJECT

1. GENERAL

This general section describes the project including:

- A description of the work
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

- 1.1 READ ALL SECTIONS TOGETHER
Read all general sections together with all other sections.

Description of the work

- 1.2 SCOPE OF THE WORK
New 4 bedroom dwelling consisting of AAC panel , linea & Stone veneer cladding with profiled metal roofing

- 1.3 RESTRICTED BUILDING WORK
This project includes Restricted Building Work.

Site

- 1.4 SITE
The site consists of: A levelled building platform,
as shown on drawings Site Plan

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

- 1.6 EXISTING SERVICES
The following are the network utility services:
- | | |
|--------------------|-----|
| Electrical: | yes |
| Telecommunication: | yes |
| Water: | yes |
| Gas: | no |
| Stormwater: | Yes |
| Foul water: | Yes |

Site environment - Wind

- 1.7 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN
The design wind pressures are to [NZS 3604](#), Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone Refer drawings (refer to [NZS 3604](#), table 5.4)

Site environment - Durability

- 1.8 EXPOSURE ZONE
The exposure zone is to [NZS 3604](#), Section 4 Durability, 4.2 Exposure zones and [NZBC E2/AS1](#).
The site zone is: Refer drawings

Site environment - Seismic

- 1.9 EARTHQUAKE ZONE - NON SPECIFIC DESIGN
The zone is to [NZS 3604](#), Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone is: Refer Drawings

1232 INTERPRETATION & DEFINITIONS

1. GENERAL

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

1.1 DEFINITIONS

Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Review:	Review by the contract administrator is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under Health and Safety at Work Act 2015).

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
PCBU	Person Conducting a Business or Undertaking (under Health and Safety at Work Act 2015)
OSH	Occupational Safety and Health
TA	Territorial Authority

TNZ	Transit New Zealand(Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design

1.4 DEFINED WORDS

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

1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

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 F4/AS1	Safety from falling
NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1170.2	Structural design actions - Wind loads
AS/NZS 3012	Electrical installations - Construction and demolition sites
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3404:1997	Steel structures standard
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 4210	Masonry construction: Materials and workmanship
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 in Employment Regulations 1995 (reprint 4 April 2016)	
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
SARNZ	Best practice guideline for scaffolding in New Zealand

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

Building Consent Authority documentation

1.1 BUILDING CONSENT

Obtain the building consent forms and documents from the owner and keep them on site. Liaise with the BCA 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 LPB previously advised.

Include the following as applicable

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

Also provide names and contact details of the following

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

1.5 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.

1.6 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

1.7 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 - Construction from the applicator / installer
- Producer Statement - 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.

1.8 NO SUBSTITUTIONS

Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

1.9 PROPOSED SUBSTITUTIONS

A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the contractor where the contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

1.10 NOTIFICATION OF SUBSTITUTIONS

Notify 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
- 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

1.11 ACCEPTANCE OF SUBSTITUTIONS

The Contract administrator must advise of acceptance of substitutions in writing.

Variations to issued Building Consent

1.12 CONTRACTOR VARIATION 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 variation.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.13 PRINCIPALS VARIATION 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

1.14 BRANDED WORK SECTIONS

Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

1.15 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

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

Branded work sections

1.16 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.

1240 ESTABLISHMENT

1. GENERAL

This general section relates to site establishment including:

- Notices and approvals
- Inspections
- Site preparation
- Signage
- 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 (in addition to building consent approval) for and the satisfactory completion of, the works.

1.3 NOTIFY NETWORK UTILITY OPERATORS

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

Inspections

1.4 CARRY OUT INSPECTIONS

As per Council Inspection Checklist

Site preparation

1.5 SITE ACCESS

Access to the site is not limited

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).

1.7 GROUND CONDITIONS

Refer to the soils investigation report included with this specification.

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 and shoring
- General care and protection

Temporary works

1.1 COMPLY WITH NEW ZEALAND BUILDING CODE

Refer to [New Zealand Building Code](#) clauses and approved document paragraphs for the criteria and/or methods that must be used in this section to establish compliance with the code.

1.2 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.3 MAINTENANCE OF TEMPORARY WORKS

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

1.4 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

Take all 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.

1.5 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

1.6 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

Prevent silt run off by:

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

Provide sediment control by:

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

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

1.7 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

Provide appropriate measures to prevent cement/concrete washwater or slurry run off to; drains or waterways, landscaped areas new or remaining and adjoining public or private

properties. Comply with territorial and other authority requirements relating to cement/concrete washwater.

Control run off from:

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

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

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

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

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

Spilt or surplus material:

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

Pump washwater away from drains, waterways and adjoining property.

1.8 EXCAVATION SAFETY

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

Carry out excavation to WorkSafe NZ, [Good Practice Guidelines - Excavation Safety](#).

This may include, deep excavation, trenching, and areas behind unfilled retaining walls. Carry out excavation using plant and equipment suitable for the purpose.

1.9 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

Temporary services

1.10 WATER

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

1.11 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 exceeding three monthly intervals.

1.12 TELEPHONE

Provide on-site temporary telephone facilities.

Scaffolding and shoring

- 1.13 GENERAL SCAFFOLDING
Provide as necessary general scaffolding for the efficient execution of the works.
Placement, erection and structure to be by certified suppliers/erectors and approved by the WorkSafe NZ inspectors before being used. Comply with the SARNZ publication: "[Best practice guideline for scaffolding in New Zealand](#)."

Care and protection

- 1.14 MAKE GOOD EXISTING SERVICES
Make good all damage to existing roads, footpaths, grounds, sewers or other services, caused in carrying out the contract works.
- 1.15 PROTECT EXISTING TREES
Protect existing trees, fences, gates, walls, gardens and other designated site features which are to remain in position during the execution of the works.
Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.
- 1.16 CONSTRUCTION KEYING AND SECURITY
Provide locksets with temporary keying, or install with the cylinders removed.
- 1.17 TEMPORARY STORAGE
Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers' requirements.
- 1.18 PERIODIC SITE CLEANING
Carry out periodic site cleaning during the contract period. Place waste material in appropriate storage pending removal from the site.
- 1.19 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. Keep food waste separate from construction waste.

1256 WASTE MANAGEMENT

1. GENERAL

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

Equipment

1.1 CONTAINERS

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

Conditions

1.2 STORAGE

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

1.3 PLANNING

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

Application

1.4 DEMOLITION

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

1.5 DISMANTLING/REUSE

- Dismantle, store and protect items, elements and components for reuse on site.
- Dismantle, store and protect items, elements and components for recycling off site.
- Dismantle store and protect items, elements and components for return to the owner.

1.6 SITE CLEARING

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

1.7 CONCRETE

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

1.8 WOOD

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

1.9 PLASTERBOARD

- Include for both horizontal fitting of sheets and customised sheet lengths.
- Retain larger off-cuts for use around doors, windows or built-in items.

1.10 PLUMBING

- Select plumbing materials with a high recycled content.
- Ensure that reusable packaging materials are returned to the vendors.

- Retain PVC off-cuts for use as stubs.
- Separate and recycle plastics.

1.11 ELECTRICAL

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

1.12 MECHANICAL

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

Completion

1.13 CLEANING

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

1270 CONSTRUCTION

1. GENERAL

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

- Quality assurance
- Noise and nuisance
- Set out
- Common execution requirements
- Common materials requirements
- Supply of spare materials
- Common requirements for samples and tests
- Final presentation and cleaning
- Commissioning

Quality control and assurance

1.1 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.

Noise and nuisance

1.2 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.

1.3 DAMAGE AND NUISANCE

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

Set-out and tolerances

1.4 SURVEY INFORMATION

Locate and verify survey marks and datum points required to set out the works. Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

1.5 SET-OUT AND DATUM

Set out the work to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

1.6 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Provide a certificate prepared by a licensed cadastral surveyor that the building has been constructed within the allowed height in relation to boundary. Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator

1.7 **USE OF SET-OUT INSTRUMENTS**
Permit without charge, the use of instruments already on site for checking, setting out and levels.

1.8 **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.

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

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404 :1997 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.10 **EXAMINE PREVIOUS WORK**
Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the contract administrator defects that may affect the quality of the proposed work and obtain instructions. Commencing work on any part means that previous work is accepted as being satisfactory for work of the required standard.

1.11 **WORKER QUALIFICATIONS**
All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

1.12 **MINIMISE DELAYS DUE TO WEATHER**
Use appropriate techniques and methods to prevent damage and minimise delays due to weather.

Materials

1.13 **NEW PRODUCTS AND MATERIALS**
Materials and products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.

1.14 **COMPATIBILITY OF MATERIALS AND FINISHES**
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.

1.15 **STORING PRODUCTS AND MATERIALS**
Take delivery of and store products, materials and components in accordance with codes of practice and the product manufacturer's or supplier's stated requirements. Maintain

the proper condition of any protective packaging, wrappings or supports during delivery, unloading and storage.

1.16 HANDLING PRODUCTS AND MATERIALS

Handle products, materials and components in accordance with codes of practice and the manufacturer's or supplier's stated guidelines. Avoid distortion and any contact with potentially damaging surfaces or conditions.

1.17 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.

1.18 INSTALLING PRODUCTS AND MATERIALS

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.

1.19 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.

1.20 CONDITION OF MATERIALS AND COMPONENTS

To be in perfect condition when incorporated into the work.

1.21 INCOMPATIBLE MATERIALS AND METALS

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 and tests

1.22 SAMPLES AND PROTOTYPES

Where specified in the work sections, submit samples, prepare sample panels, and construct prototypes for review as to appearance, form and conformance with the drawings and specifications. Submit all information required to assist the review process, including technical data, manufacturer's literature, independent appraisals and producer statements.

Timing for the provision and review of samples, sample panels and prototypes to be included in the contract programme. Allow a minimum of 10 working days for each review. Proceed only after instructions to proceed have been issued in writing by the contract administrator.

In situ work may be incorporated in the finished work if so confirmed, otherwise allow to remove completely and replace.

1.23 CONTROL STANDARD

Obtain the contract administrator's confirmation of material, component and work samples which then become the quality control standard. Remove from the site any rejected samples. Retain confirmed samples with care on site for comparison throughout the contract. Remove from the site when no longer required.

Spares

1.24 SPARES

Collect, protect and store safely all spare materials required under the contract. Give the contract administrator an inventory of all spares.

Final presentation and cleaning

- 1.25 **REMOVE TEMPORARY PROTECTION**
Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.
- 1.26 **REPLACE DAMAGED MATERIALS**
Replace all materials or component damaged during the works to the standard of and integral with the original.
- 1.27 **COMPLETE ALL SERVICES**
Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.
- 1.28 **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.
 - 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
- Commissioning**
- 1.29 **MOVING PARTS**
Adjust, ease and lubricate all doors, windows, drawers, hardware, appliances, controls and all moving parts to give easy and efficient operation.
- 1.30 **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.

2210 PREPARATION & GROUNDWORK

1. GENERAL

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

- footings and floor slabs
- backfilling behind basement retaining walls

Documents

1.1 DOCUMENTS

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

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

1.2 SITE SAFETY

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

1.3 ARCHAEOLOGICAL DISCOVERY

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

2. PRODUCTS

2.1 EXCAVATED CLEAN FILL

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

2.2 VOLCANIC TUFF FILL

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

2.3 ROCK FILL

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

2.4 SAND FILL

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

2.5 HARD FILL

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

2.6 GRANULAR FILL

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

2.7 DRESSING COURSE

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

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

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 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. Confirm any changes with the territorial authority.
Below slabs on grade: Hardfill compacted in 150mm layers
Below footings: 10 MPa concrete
Service trenches: Hardfill compacted in 150mm layers

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.
- 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 RETAINING WALLS
Backfill behind retaining walls with free draining granular material and compact in 200mm
layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing
are not damaged.
- 3.16 SURPLUS MATERIAL
Remove surplus and excavated material from the site.

3101 CONCRETE WORK - BASIC

1. GENERAL

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

- 1.1 RELATED WORK
Refer to Foundation Plan & Details

Documents

- 1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:
- | | |
|-----------------------------|---|
| NZBC B1/AS1 | Structure |
| NZBC E2/AS3 | External moisture |
| AS 1366.3 | Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M) |
| NZS 3101.1 | Concrete structures standard |
| NZS 3104 | Specification for concrete production |
| NZS 3109 | Concrete construction |
| NZS 3114 | Specification for concrete surface finishes |
| NZS 3604 | Timber-framed buildings |
| NZS 4229 | Concrete masonry buildings not requiring specific engineering design |
| AS/NZS 4671 | Steel reinforcing materials |
| AS/NZS 4858 | Wet area membranes |
| CCANZ CP 01 | Code of practice for weathertight concrete and concrete masonry construction |

- 1.3 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to this part of the work:
As Selected by Builder

Manufacturer/supplier contact details

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

2. PRODUCTS

- 2.1 NORMAL CONCRETE
Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to [NZS 3104](#). Provide delivery dockets listing mix and despatch details.
- 2.2 REINFORCEMENT
Bars to [AS/NZS 4671](#). Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to [AS/NZS 4671](#).
- 2.3 MESH FOR SLABS TO NZS 3604 OR NZS 4229
For slabs on ground mesh to be welded reinforcing mesh to [AS/NZS 4671](#), Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m² (1.14kg/m² in each direction).
- 2.4 TYING WIRE
Mild drawn steel wire not less than 1.2mm diameter.
- 2.5 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

- 2.6 DAMP-PROOF MEMBRANE
0.25mm minimum polyethylene to [NZS 3604](#), 7.5.4, Damp-proof membrane.

3. EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 FALSEWORK AND FORMWORK

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

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

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

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

3.3 INSTALL DAMP-PROOF MEMBRANE

Apply polythene membrane to prepared basecourse with 150mm laps between sheets. Tape seal laps and penetrations with 50mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.

3.4 CUT AND BEND REINFORCEMENT

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

3.5 ADJUSTMENTS

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

3.6 TOLERANCES, BENDING

To [NZS 3109](#), 3.9, Tolerances for reinforcement.

3.7 SECURE REINFORCEMENT

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

3.8 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Increase laps of plain round steel by 100%. Provide laps only where indicated on the drawings. Tie all lapping bars to each other.

Welded wire mesh laps to [NZS 3101](#), lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

- 3.9 **MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229**
For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:
- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements
Do not count bar extensions beyond the outermost cross wire.
- 3.10 **REINFORCEMENT COVER TO NZS 3604 OR NZS 4229**
For in-situ concrete, foundations and interior slabs on ground, to [NZS 3604](#) or [NZS 4229](#), the reinforcement and welded mesh cover to be:
- | Location, cover to | NZS 3604 | NZS 4229 |
|---------------------------|-----------------|-----------------|
| Footing, to earth | 75mm | 75mm |
| Footing, to DPM | 75mm | 50mm |
| Foundation, to edge | 75mm | 75mm |
| Slab, to slab top | 30mm | 30mm |
| Slab, to slab edge | 50mm to 75mm | 50mm to 75mm |
- 3.11 **CASTING IN**
Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.
- Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.
- Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.
- Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.
- 3.12 **PRE-PLACEMENT INSPECTION**
Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.
- 3.13 **SURFACE FINISHES**
To [NZS 3114](#), 105, Specification of finishes, as scheduled or as denoted on the drawings.
- 3.14 **CONCRETE SURFACE TOLERANCES**
To [NZS 3114](#), 104, Surface tolerances and [NZS 3114](#), 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.
- 3.15 **PUMPING CONCRETE**
Set up and supervise pump operation, placing and compaction of the mix to [NZS 3109](#), 7.4, Handling and placing and [NZS 3109](#), 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.
- 3.16 **COMPACTION**
Use power operated vibrators on foundations, vertical constructions and beams.
- 3.17 **FLOOR SLABS TO NZS 3604**
Generally for slabs on ground to [NZS 3604](#) as modified by [NZBC B1/AS1](#) and [NZBC E2/AS3](#).
Construct to [NZS 3604](#), 4.5 **Concrete and concrete masonry** and [NZS 3604](#), 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by [NZBC B1/AS1](#), 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power)

trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to [NZS 3114](#), 304, **Surface tolerances**.

Allow for free joints maximum 24m centres to [NZBC B1](#)/AS1, 3.1.13 **NZS 3604 New clause**.

3.18 SAW CUTS TO NZS 3604 OR NZS 4229

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

3.19 SPACING OF SAW CUTS

Spacing of sawcuts

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

3.20 SURFACE DEFECTS

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

3.21 CURING OF CONCRETE

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

3.22 STRIKE FORMWORK

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

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

3.23 CLEAN OUT

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

3.24 REMOVE

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

4. SELECTIONS

4.1 DAMP-PROOF MEMBRANE

Brand/type: 0.25mm polythene

4.2 REINFORCEMENT LAPS

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

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.3 NORMAL CONCRETE

Normal concrete:

17.5 MPa: for reinforced concrete either not exposed to weather or exposed to the weather in Zone B.

4.4 SURFACE FINISHES FLOOR SLABS

Surface finish class to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U3	Slab

4.5 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

Surface finish class to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U2 wood float finish	Patios / Driveway

3820 CARPENTRY

1. GENERAL

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

1.1 RELATED WORK

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

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 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.5	Specification for preservative treatment - Glue laminated timber products
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

***A copy of [NZS 3604](#) Timber-framed buildings, must be held on site.**

1.3 DIMENSIONS

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

2. PRODUCTS

2.1 TIMBER FRAMING, TREATED

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

2.2 PLYWOOD

Structural plywood to [AS/NZS 2269.0](#) for bracing, bracketing, sarking and floors.

2.3 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.

2.4 BOLTS AND SCREWS

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

2.5 NAIL PLATES

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

2.6 CONNECTORS

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

- 2.7 **CORROSION RISKS**
For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.
- For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).
- 2.8 **DPC**
Refer to 4161 UNDERLAYS, FOIL AND DPC section
3. **EXECUTION**
- 3.1 **EXECUTION GENERALLY**
To [NZS 3604](#) except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
- 3.2 **SEPARATION**
Separate all timber framing timbers from concrete, masonry and brick by: -
- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space
- 3.3 **ATTENDANCE**
Provide and fix blocks, nogs, openings and other items as required by other trades.
- 3.4 **MOISTURE CONTENT**
Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.
Framing at erection: 24% maximum
Framing at enclosure: 20% maximum
Framing at lining: 16% maximum
- 3.5 **SET-OUT**
Set out framing in accordance with the requirements of [NZS 3604](#) and as required to support sheet linings and claddings.
- 3.6 **FRAMING WALLS**
Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to [NZS 3604](#), section 8, **Walls**.
- 3.7 **FRAMING ROOFS**
Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to [NZS 3604](#), section 9, **Posts** and 10, **Roof framing**.
- 3.8 **FRAMING CEILINGS**
Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to [NZS 3604](#), section 13, **Ceilings**. Trim for openings in ceilings and hatches to [NZS 3604](#) section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to [NZS 3604](#), section 13.4, **Water tanks in roof space**.
- 3.9 **INSTALLING WALL UNDERLAYS**
Refer to 4161 UNDERLAYS, FOIL AND DPC section
- 3.10 **FIT CAVITY BATTENS**
Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to [NZS 3604](#). Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.11 DPC TO LOSP TREATED TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.12 DPC TO TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4. SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.2 CAVITY BATTENS

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

4.3 ROOF FRAMING - RADIATA PINE

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

4.4 EXTERIOR EXPOSED TIMBERS

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

Note all CCA to be preservative code 01 or 02

4.5 INTERIOR FRAMING - RADIATA PINE

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

4.6 PLYWOOD

Member	Brand/type	Treatment
Plywood bracing:	Ecoply	H3

4.7 DPC
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4.8 NAILS

Location	Type	Material	Finish
as selected			

4.9 BOLTS AND SCREWS

Location	Type	Material	Finish
as selected			

4.10 NAIL PLATES

Location	Type	Material	Finish
as selected			

4.11 CONNECTORS

Location	Type	Material	Finish
as selected			

4161 UNDERLAYS, FOIL AND DPC

1. GENERAL

This section relates to the application of:

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

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

Requirements

1.3 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice.

2. PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

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

DPM

- 2.2 **DAMP PROOF MEMBRANE - CONCRETE FLOOR**
Polyethylene sheet with minimum thickness of 0.25mm to [NZS 3604](#), 7.5.6,
Polyethelene (polythene) sheet damp-proof membranes.

Wall Underlays

- 2.3 **ABSORBENT SYNTHETIC WALL UNDERLAY - POLYPROPYLENE**
Absorbent, breathable spun bonded polypropylene type building membrane, coated with a breathable water resistant film.

Roofing Underlay

- 2.4 **SYNTHETIC NON-WOVEN SELF SUPPORTING ROOFING UNDERLAY**
A non-woven self supporting roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs; with flammability index tested to [NZS/AS 1530.2](#), AS/[NZS 2295](#).
- 2.5 **SYNTHETIC NON-WOVEN ROOFING UNDERLAY**
A non-woven roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs; with flammability index tested to NZS/AS 1530.2, AS/[NZS 2295](#).

Accessories

- 2.6 **WINDOW DOOR SEALING SYSTEM**
Proprietary window and door flashing tape and accessories to E2/AS1, paragraph 4.3.11, **Flexible flashing tape**, paragraph 9.1.5, **Wall underlays to wall openings.**
- 2.7 **STUD STRAPS**
19mm wide polyethylene straps, for cavity construction with framing centres greater than 450mm.
- 2.8 **WIRE NETTING**
75mm galvanized hexagonal wire netting to [AS/NZS 4534](#).
- 2.9 **GUTTER AND UNDER FLASHINGS**
Bituminous breather type underlay cut to width by manufacturer for use under valley, apron flashing and internal gutters. Soffit liner cut to width from bituminous breather type underlay.
- 2.10 **ADHESIVE TAPE**
Adhesive tapes to compliment the underlay. Pressure sensitive tapes for joining foil insulation and vapour barriers.

3. EXECUTION

Conditions

- 3.1 **GENERAL REQUIREMENTS**
To [NZBC E2/AS1](#) Table 23 Properties of Roof Underlays and Wall Underlays; and manufacturers technical literature.
Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

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

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

Application - DPC

- 3.4 **POLYETHYLENE DPC TO TIMBER**
Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.
- 3.5 **DPC TO MASONRY AND BRICK VENEER**
Lay DPC along base of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.
- 3.6 **DPC BETWEEN DISSIMILAR MATERIALS**
Lay DPC between dissimilar materials where required.

Application - DPM

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

Application - Wall Underlay

- 3.8 **WALL UNDERLAY**
Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150mm to [NZBC E2/AS1](#), clause 9.1.7, **Wall underlay** and refer to manufacturer for requirement for fastenings. Fix to manufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.
- 3.9 **INSTALL STUD STRAPS**
Over underlay, install 19mm wide polyethylene straps horizontally at 300mm centres, draw taut and fix to studs with stainless steel staples.

Application - Roofing Underlay

- 3.10 **INSTALL WIRE NETTING**
Lay 75mm galvanized wire netting at right angles across the purlins and drawn taut before fixing. Tie edges of netting together with galvanized wire clips.
- 3.11 **ROOF UNDERLAY**
Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based roofing underlays, 7 metres for fire retardant underlays and 20 metres for synthetic roofing underlays. Do not lay vertically on roof pitches under 10°.
- Lay horizontally across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations. Avoid prolong exposure by installing the roof immediately. UV exposure maximum 7 days.
- 3.12 **GUTTER AND UNDER FLASHINGS**
Lay bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, internal gutters and soffit liner. Lap under flashings with adjoining underlays. Fix soffit liner from top plate down 150mm past ribbon plate.

Completion

- 3.13 CLEAN UP
Clean up as the work proceeds.
- 3.14 LEAVE
Leave work to the standard required by following procedures.
- 3.15 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 DPC
Location: Bottom Plates
Brand / type: Polyethylene
- 4.2 DPM
Location: Under Concrete Slab
Brand / type: polyethylene DPM
Thickness: 0.25mm
Jointing tape: brand matched
- 4.3 WALL UNDERLAY
Location: Walls
Brand / type: As supplied by builder
Jointing tape: Brand Matched
- 4.4 ROOFING UNDERLAYS
Location: Roof
Brand / type: As supplied by Builder
Jointing tape: Brand matched

Accessories

- 4.5 WINDOW/DOOR SEALING SYSTEM
Brand / type: flashing tape
- 4.6 STUD STRAPS
Location: Walls
Brand / type: 19mm wide polyethylene strap
- 4.7 WIRE NETTING
Location: Under Roofing Underlay
Brand / type: As supplied by Builder

4231HW JAMES HARDIE WEATHERBOARD CLADDING

1. GENERAL

This section relates to the supply and fixing of the following fibre cement products:

- James Hardie Linea® Weatherboard cladding
- James Hardie Linea® Oblique Weatherboard cladding
- James Hardie Weatherboard cladding
- James Hardie Villaboard® Soffit Lining
- James Hardie selected soffit lining

Documents

1.1 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC E2/VM1	Weathertightness
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie documents relating to this part of the work:

Linea® Weatherboard technical specification

Linea® Oblique Weatherboard horizontal installation technical specification

Linea® Oblique Weatherboard vertical installation technical specification

James Hardie Weatherboards technical specification

Eaves and Soffit Linings installation manual

[BRANZ Appraisal 446](#) - Linea® Weatherboard Direct Fixed Cladding

[BRANZ Appraisal 447](#) - Linea® Weatherboard Cavity Cladding

[BRANZ Appraisal 896](#) - Linea® Oblique Weatherboard (Horizontal) Cavity Cladding

[BRANZ Appraisal 897](#) - Linea® Oblique Weatherboard (Vertical) Cavity Cladding

CodeMark™ Certificate Number [GM-10-30018](#) James Hardie Linea™ Weatherboard Direct fixed and Cavity Cladding

Manufacturer/supplier contact details

Company: James Hardie New Zealand

Web: www.jameshardie.co.nz

Email: info@jameshardie.co.nz

Telephone: Contact James Hardie™ on 0800 808 868

BRANZ appraisal is available at www.branz.co.nz.

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years: For Linea® Weatherboard / Linea® Oblique Weatherboard product (refer to James Hardie™ product warranty)

15 year: For accessories supplied by James Hardie (refer to James Hardie™ product warranty)

From: Date of purchase

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

- 1.4 NO SUBSTITUTIONS
Substitutions are not permitted to any specified system, or associated components and products.
- 1.5 INFORMATION FOR OPERATION AND MAINTENANCE
Provide relevant James Hardie maintenance requirements at completion of the work.

Requirements - Linea Weatherboard with CodeMark™ Certificate

- 1.6 QUALIFICATIONS - LINEA® INSTALLER
Installer to be experienced in the application and a;
- A Licenced Building Practitioner; or,
- A person with a trade certificate being a current member of a Building Trade Association.
If requested provide evidence of qualification prior to commencing work.
- 1.7 LINEA® WEATHERBOARD INSTALLATION INFORMATION
Installer to comply with all the relevant information in;
- Linea® Weatherboard Technical Specification (Mar 2015); and,
- [BRANZ Appraisal 446](#) or [BRANZ Appraisal 447](#)
- 1.8 LINEA® WEATHERBOARD INSTALLATION CHECKLIST
Installer to complete, sign and provide a James Hardie Installation Checklist (Dec 2010) incorporating the Certificate of Installation requirements of Global-Mark CodeMark Certification program. Contact James Hardie for a copy of the Installation Checklist.

Performance

- 1.9 PERFORMANCE, WIND
The design wind pressures are to [NZS 3604](#), up to and including Extra High Wind Zone. James Hardie Technical Specifications are suitable for these conditions.

2. PRODUCTS

Materials

- 2.1 WALL UNDERLAY
For flexible wall underlays and rigid wall underlays, refer to the appropriate separate section(s).
- 2.2 EXTERIOR CAVITY BATTENS
Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To [NZS 3602](#), Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.
- 2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING
Perforated uPVC, with upstands.
- 2.4 LINEA® WEATHERBOARDS
James Hardie Linea® Weatherboards, 16mm thick, pre-primed, manufactured from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving, manufactured to [AS/NZS 2908.2](#), tested to [NZBC E2/VM1](#) for weathertightness and complying with the NZBC.

Components

- 2.5 FASTENER TYPE
Fasteners to minimum durability requirements of the NZBC. Refer to [NZS 3604](#), section 4, **Durability**, for requirements for fixing's material to be used in relation to the exposure conditions.

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

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

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

- 2.6 SCREWS
30mm x 7 gauge stainless steel HardieDrive screws

- 2.7 GALVANIZED NAILS
60mm x 3.15mm diameter jolt head
75mm x 3.15mm diameter jolt head
90mm x 4.0mm diameter jolt head
HardieFlex™ Nail 40mm x 2.8mm diameter
HardieFlex™ Nail 50mm x 2.8mm diameter
HardieFlex™ Nail 60mm x 3.15mm diameter
HardieFlex™ Nail 75mm x 3.15mm diameter

- 2.8 STAINLESS STEEL NAILS
60mm x 3.15mm diameter jolt head 316 grade
75mm x 3.15mm diameter jolt head 316 grade
90mm x 4.0mm diameter jolt head 316 grade
HardieFlex™ Nail 40mm x 2.8mm diameter 316 grade
HardieFlex™ Nail 50mm x 2.8mm diameter 316 grade
HardieFlex™ Nail 60mm x 3.15mm diameter 316 grade
HardieFlex™ Nail 75mm x 3.15mm diameter 316 grade

Accessories

- 2.9 SEALANT
Silaflex AT-Facade sealant or similar. Refer to James Hardie technical specifications for application requirements.

3. EXECUTION

Conditions

- 3.1 STORAGE
Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.
- 3.2 HANDLING
Avoid distortion and contact with potentially damaging surfaces. Carry weatherboards in vertical position. Do not drag weatherboards across each other, or across other materials. Protect edges, corner and surface finish from damage.
- 3.3 SUBSTRATE
Do not commence work until the substrate is of the standard required by James Hardie for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by [NZS 3602](#) to minimise shrinkage and movement after sheets are fixed.

Application - generally

- 3.4 INSTALL CAVITY BATTENS
Install 18mm minimum thick cavity battens 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 under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open

horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.5 PENETRATIONS AND FLASHINGS

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

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

3.6 INSTALL LINEA® WEATHERBOARDS

Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Fit internal corners and fix weatherboards as per Linea® Weatherboard technical specifications. Fit and fix external corners and joint soakers as required.

3.7 INSTALL FLASHINGS

Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to [NZBC E2/AS1](#).

Completion

3.8 REPLACE

Replace all damaged or marked elements.

3.9 LEAVE

Leave work to the standard required for following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 CAVITY BATTENS

Timber species: Radiata pine
Treatment: H3.1

Linea® Weatherboards

4.2 JAMES HARDIE LINEA® WEATHERBOARDS

Location: As per plans
Brand/type: James Hardie Linea® Weatherboard
Thickness: 16mm
Width: 150mm
Construction: Cavity fix
Nail pattern: TBC
Nail finish: TBC
Nails: TBC

Finishing

4.3 PAINTING

Refer to painting section(s) for details.

4282RI RCS INTEGRA LIGHTWEIGHT CONCRETE FACADE SYSTEM

1. GENERAL

This section relates to the supply and fixing of **Resene Construction Systems** Integra Lightweight Concrete Facade System, cavity based exterior wall cladding system based on Integra AAC light weight concrete panels fixed over a drained cavity to timber framing and with an applied textured surface finish.

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:

PPCS	Proprietary Plaster Cladding Standard
MPNZA	Master Painters New Zealand Association
LRV	Light Reflectance Value

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 E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
	Health and Safety at Work Act 2015

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Resene Construction Systems Technical Manual
- Resene Construction Systems Trade Spec™
- Resene Construction Systems Project Guide
- Resene Total Colour System
- [BRANZ Appraisal 681](#) - Integra Light Weight Facade System

Materials and execution to Resene Construction Systems specification except where varied by this specification and supported by architectural detailing.

Manufacturer/supplier contact details

Company:	Resene Construction Systems
Web:	www.reseneconstruction.co.nz
Email:	help@reseneconstruction.co.nz
Telephone:	0800 50 70 40

Contact details for Resene literature is 0800 RESENE (0800 737 363) or web site www.resene.co.nz.

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For materials by Resene Construction Systems

- Provide this warranty on the Resene Construction Systems 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 execution/workmanship - by Registered Plasterer

- Provide this warranty on the Resene Construction Systems 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

Use only PPCS (Proprietary Plaster Cladding Standard) registered applicators licensed to apply the Resene Construction Systems exterior render systems.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Resene Construction Systems exterior render system.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Resene Construction Systems Maintenance Guide on or before practical completion of the contract for issuing to the building owner. Resene Construction Systems Maintenance Guide to be provided on request. Provide ongoing maintenance instructions to meet the performance requirements of [NZBC B2/AS1](#).

1.9 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 and risks is not possible then minimise hazards and risks in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and risks, and put into place procedures for dealing with emergencies. Obtain from Resene Construction System the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.10 PRODUCER STATEMENT

Provide the producer statement compiled by the licensed applicator in the form as required by the Building Consent Authority.

Performance

1.11 PERFORMANCE

Accept responsibility for the structural and weather-tight performance of the cladding installation.

1.12 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone and topographical classification (T) of this site and building height; as required by [NZS 3604](#) and the wind loads on various wall areas as given by [AS/NZS 1170.2](#).

1.13 INSPECTIONS

Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives of Resene Construction Systems to inspect the work in progress and to take samples of their products from site if requested refer to Resene Construction Systems Project Guide.

2. PRODUCTS

Materials

- 2.1 RESENE CONSTRUCTION SYSTEMS RENDERPREP
Waterborne acrylic polymer dispersion.
- 2.2 INTEGRA AAC PANEL
50mm thick fibre reinforced aerated concrete, 2200mm x 600mm panel.
- 2.3 ROCKCOTE MULTISTOP BEDDING COMPOUND
Polymer modified cement-based dry plaster mix.
- 2.4 ROCKCOTE PM100 QUICK RENDER
Polymer modified cement-based dry plaster mix.
- 2.5 RESENE LIMELOCK
Waterborne acrylic polymer dispersion.
- 2.6 MINERAL TEXTURE
Polymer-modified cement based dry plaster mix.
- 2.7 ACRYLIC TEXTURE
100% acrylic, high-build texture coating.
- 2.8 RESENE X-200
Resene X-200 waterproof membrane, colour selection from Resene Total Colour System.
- 2.9 REINFORCING MESH
Resene Construction Systems Qual brand alkali-resistant fibreglass woven mesh and sticky mesh 150mm wide.

Components

- 2.10 RESENE CONSTRUCTION SYSTEMS CAVITY BATTENS
Type: 40mm x 40mm polystyrene battens
- 2.11 FIXINGS, TIMBER FRAME
Minimum 100mm x 14 g countersunk screws for 20mm cavity. Fixings to be galvanized or zinc plated steel to AS 3566 class 3.
- 2.12 EXTERIOR CAVITY BASE VENTED STARTER TRACK
70mm perforated uPVC Resene Construction Systems ventilated starter track.
- 2.13 FLASHINGS AND ACCESSORIES
Resene Construction Systems proprietary profiles made from rigid uPVC for head, sill, jamb, starter strips (vermin proofing); expansion and control joints; jamb sill and head jamb soakers; corner and base exterior applications.

Accessories

- 2.14 SEALANT
BRANZ appraised modified silicon (MS) sealant.
- 2.15 PRIMING STEEL
Resene Galvo-Prime, a brush applied waterborne galvanised iron primer or Zinc rich spray pack primer / solvent borne an exterior solvent borne spray application.

3. EXECUTION

Conditions

- 3.1 DELIVERY
Keep plaster products dry in transit. Take delivery of plaster products dry and undamaged. Reject all damaged materials.

- 3.2 **STORAGE**
Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Do not store PVC corner beads in direct sunlight.
- 3.3 **SUBSTRATE**
Do not begin the application until required openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparation are complete. Do not commence plastering until substrate is of the required standard. All defects in substrate must be rectified prior to application of plaster coatings commencing.
- 3.4 **PANEL APPLICATION CONDITIONS**
Carry out panel fixing to Resene Construction Systems specification under conditions which will not adversely affect the finished work. Temperature must be above 5°C, cover work to protect it from cooler temperatures, refer to Resene Construction Systems specification.
- 3.5 **PROTECT**
Before installation of Integra AAC panels and subsequent application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.
- 3.6 **PLASTERING CONDITIONS**
Carry out plastering to Resene Construction Systems specification under conditions which will not adversely affect the finished work.
- 3.7 **FLASHING AND DETAILING**
Comply with the Resene Construction Systems penetration flashing guidelines. Carry out to the required standard of execution to ensure water does not penetrate.
- 3.8 **ALIGNMENT OF FRAMING**
To the standard required by the Resene Construction Systems, plumb, level and in true alignment.
- 3.9 **CONFIRM LAYOUT**
Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.
- Application**
- 3.10 **CAVITY BATTENS**
Fix polystyrene battens full length to studs, using a minimum 50mm nail, to achieve a 20mm minimum thickness drained cavity to [NZBC E2/AS1: 9.0 Wall claddings](#). 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. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens must be no longer than 100mm. Use cavity spacers where fixing is required between cavity battens. Fix additional battens to internal and external corners and around openings to Resene Construction Systems standard details.
- 3.11 **PENETRATIONS**
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:
- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
 - claddings neatly finished off to all sides of openings
 - installation of flashings (those required to be installed prior to installation of penetrating elements).
 - where electrical cables pass through cladding, ensure that there is no direct contact with the Integra panel, conduit required to be installed by electrician.

- 3.12 **PENETRATION FLASHINGS**
Fix in place required uPVC trims, profiles flashings and control joints. Service penetrations such as piping and light fittings to be sealed by specific trade.
- 3.13 **INTEGRA AAC PANELS**
Horizontally screw fix in a stretcher bond pattern to the battens to Resene Construction Systems requirements. Fixings to be a minimum of 50mm from the edge of the panel. Bond all horizontal and vertical joints with MultiStop bedding compound. Panels can cantilever beyond a stud to a maximum of 305mm.
- 3.14 **SEAL COAT INTEGRA PANEL**
Seal Integra Panel with one coat of Resene Construction Systems RenderPrep.
- 3.15 **PRIMING STEEL**
Use either Resene Galvo-Prime or Zinc rich spray pack primer to make sure that all exposed steel has been spot primed.
- 3.16 **PANEL PATCHING**
Apply Rockcote MultiStop as a substrate patching to Resene Construction Systems requirements. MultiStop Bedding to bug/blow holes greater than 10mm but less than 40mm diameter. MultiStop Finishing to bug/blow holes less than 10mm.
- 3.17 **MOVEMENT CONTROL JOINTS**
Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and / or where shown on the drawings and to Resene Construction Systems requirements. Reinforcing mesh is not continuous across control joints. Exposed control joints to be reflected through final coatings from substrate. Confirm locations in writing to the owner before work commences.
- 3.18 **FIT FLASHINGS AND ACCESSORIES**
Check and ensure head flashings have been installed. Fit flashings to jambs and sill on recessed joinery using Resene Construction Systems proprietary flashings. Reinforce bottom edges of Integra panels with uPVC channel extrusions to Resene Construction Systems technical and installation manual.

Resene Construction Systems - Integra Lightweight Concrete Facade System

- 3.19 **BASE AND MESH COAT**
Apply Rockcote PM100 Quick Render base plaster coat 5mm thickness maximum. Embed fibreglass reinforcing mesh into the wet plaster. Overlap each successive length by 100mm minimum. Apply sticky mesh around all external corners and into all window reveals. Apply diagonal reinforcement strips at all corners of windows, doors and other exterior openings.
- 3.20 **LEVELLING COAT**
Apply by trowel or pump second coat of Rockcote PM 100 Quick Render 1-2mm thickness. Trowel flat and leave to touch dry before floating off with a large plastic float and water, to remove any imperfections and leave a level surface.
- Application - acrylic selection**
- 3.21 **SEAL COAT ACRYLIC TEXTURE FINISH**
For texture finish seal the base coats with one coat of Resene Limelock within 14 days of applying the second base coat.
- 3.22 **ACRYLIC TEXTURED FINISH COAT**
Apply Texture coat 1mm thickness minimum to achieve the specified finish and colour (optional) to Resene Construction Systems requirements.
- 3.23 **PROTECTIVE FINISH COAT**
Apply two coats of Resene X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.

- 3.24 FINISHING
Refer to SELECTIONS for system texture and colour.

Application - mineral selection

- 3.25 MINERAL TEXTURED FINISH COAT
Apply texture coat to the desired thickness to achieve the specified finish and colour (optional) to Resene Construction Systems requirements.
- 3.26 SEAL COAT MINERAL TEXTURE FINISH
For mineral texture finish seal the base coats with one coat of Resene Limelock within 14 days of applying the second base coat.
- 3.27 PROTECTIVE FINISH COAT
Apply two coats of Resene X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.
- 3.28 FINISHING
Refer to SELECTIONS for system texture and colour.

Completion

- 3.29 CLEANING
Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.
- 3.30 FINAL INSPECTION
A final inspection by Resene Construction Systems applicator and project assessor of the entire finished cladding to take place immediately after completion of the wall cladding work and any defects or subsequent damage made good immediately.

4. SELECTIONS

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

Performance

- 4.1 WIND ZONE
Building wind zone: ~ (as determined from table 5.4 of [NZS 3604](#))

Materials

- 4.2 RESENE CONSTRUCTION SYSTEMS CAVITY BATTENS
Type: 40mm x 40mm polystyrene battens
40mm x 40mm H3.2 timber (to gables and window heads)
- 4.3 RESENE CONSTRUCTION SYSTEMS UPVC VENTILATED STARTER TRACK
Type: Resene Construction Systems uPVC ventilated starter track
- 4.4 RESENE CONSTRUCTION SYSTEMS INTEGRA AAC PANEL FIXINGS
Type/finish (class): 14g x 100mm Class 3 screw
- 4.5 RESENE CONSTRUCTION SYSTEMS INTEGRA LIGHTWEIGHT CONCRETE FACADE SYSTEM
Location: Refer to drawings
Substrate: 50mm Integra AAC Panel
Panel bonding: Rockcote MultiStop Bedding compound
Panel patching: Rockcote MultiStop Bedding
Panel sealing: RCS RenderPrep
Base (1st) coat: Rockcote PM100 Quick Render; plus fibreglass mesh
Second coat: Rockcote PM100 Quick Render

Sealer coat:	Resene Limelock
Texture coat:	Acrylic Texture
Texture finish:	As selected
Texture colour:	As selected
Paint coat:	Resene X-200
Paint colour:	As selected

VENTCLAD STONE SLIP SYSTEM

1. GENERAL

This section relates to the supply, fixing and jointing of fibre cement cladding with a drained cavity, bracing panels, and solid backing for stone and brick slips.

1.1 RELATED WORK

Refer to STONE / BRICK SLIPS SYSTEMS for the required stone / brick slip including weather tightness provided by these systems.

Documents

1.2 DOCUMENTS REFERRED TO

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

NZBC B2	Durability
NZBC E2/AS1	External moisture
E2/VM1	Verification method for weathertightness
AS/NZS 1170	Structural design actions, Part 2 Wind actions
AS/NZS 2908	Cellulose-cement products: 2908.2 Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
AS/NZS 4284	Testing of building facades

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

PBS Distributors Ltd: VentClad Stone Slip System: Series VS.6.

VentClad Stone Slip System Q A checklist

VentClad Stone Slip System Installation Guide

VentClad Stone Slip System Maintenance schedule

VentClad Deed of Warranty in the form of a site specific Producer Statement

Window Engineering Consultants Ltd;

BRANZ Opinion BDO 98/3 Durability of **Eterpan**

BRANZ Appraisal 457 - VentClad Ventilated Cavity System

Copies of the above literature are available at

Web: www.pbs.co.nz

Telephone: 0800 22 55 727 PBS Distributors Ltd

Warranties

1.4 WARRANTY

PBS Distributors Ltd warrant the **VentClad** cladding system under normal environmental and use conditions against failure of materials and execution.
15 years: Warranty period

Provide the completed and signed **VentClad** quality assurance check sheet to **PBS Distributors Ltd** in order for the **VentClad** warranty to be issued. Provide the warranty in the **VentClad** standard form "Producer Statement" site specific.

Refer to the general section WARRANTIES for details of when completed warranty must be submitted.

Requirements

- 1.5 NO SUBSTITUTIONS
Substitutions are not permitted to any specified **PBS Distributors Ltd** system, or associated components and products.
- 1.6 QUALIFICATIONS
Carry out the cladding work with experienced, competent installers who have attended the **VentClad** Cladding Systems training programme or as approved by PBS Distributors Ltd.
- 1.7 ON GOING MAINTENANCE INSTRUCTIONS
Provide ongoing maintenance instructions required to meet the performance requirements of the NZBC B2 Durability.

Compliance information

- 1.8 DURABILITY
The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years when un-coated and which may be extended to 50 years when coated with a continuous waterproof coating system maintained over the service lifetime so that it remains impervious to water.
Refer to the following; BRANZ Opinion BDO 98/3.

Performance

- 1.9 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 and the wind loads on various wall areas as given by AS/NZS 1170.
- 1.10 EXTERNAL MOISTURE
No water penetration beyond the inner surface of the framing at the calculated test pressures. The total system to comply with an ULS wind pressure of ± 1550 Pa. Refer to WEC report 1373 for verification method. A building wrap may be used as a non rigid air barrier where the ULS is up to ± 1550 Pa. Where wind pressures exceed ± 1550 Pa and are less than ± 3500 Pa select 4.5mm Eterpan Base; SLS wind loads to 4930Pa select 6.0mm Eterpan Base. For SLS wind loads up to 6080Pa select 6.0mm Eterpan base and reduce framing to 400mm centres.
Contact **PBS Distributors Ltd** for specific design information where wind pressures exceed 2700Pa.
NZBC E2 External moisture. The VentClad cladding system has been tested to and meets the performance requirements of AS/NZ 4284 to the specified ULS and to NZBC E2/VM1.
- 1.11 FIRE RATING REQUIREMENTS
Provide **VentClad** two way fire rated wall systems to **VentClad** details as listed in SELECTIONS. Provide certificates and other evidence that the fire rated wall system offered will comply with the standards of performance specified.

2. PRODUCTS

Materials

- 2.1 BUILDING WRAP
Synthetic wall wraps to NZBC E2/AS1, table 23: Properties of roof underlay's and building wraps.
- 2.2 RIGID AIR BARRIER
To AS/NZS 2908.2. **Eterpan Base or Eterpan Base Sealed as Rigid Air Barrier** medium density fibre cement autoclaved sheet, 4.5mm or 6.0mm thick produced on a "flow on" process.

2.3 **BATTENS**
VentClad 50 x 20mm and 70 x 20mm timber battens with 20 x 5mm machined grooves at 100mm centres on both faces to NZS 3602, Table 1 and treated H3.2.

2.4 **MEDIUM DENSITY SHEETS**
 To AS/NZS 2908.2. **Eterpan Base** medium density, fibre cement autoclaved sheet produced on a "flow on" process, with specified edge details and surface finishes.
 Base for stone / brick slips: **Eterpan Base** 9mm x 1200mm wide x 2400mm/ 2700mm/ 3000mm long.

Components

2.5 **NAILS, STAINLESS STEEL**
 304 / 316 stainless steel 60mm and 40mm x 2.8mm flathead minimum head diameter 6.8mm. Refer to the **Eterpan Stone Slip System** Installation Guide for selection and use requirements.

2.6 **SCREWS, STAINLESS STEEL**
 304 / 316 stainless steel 63mm x 10 gauge. Refer to the **Eterpan Stone Slip System** Installation Guide for selection and use requirements.

2.7 **SCREWS FOR STEEL FRAMING**
 For steel framing, countersunk class 3.0 self drilling, self tapping, gauged to suit thickness of steel. Refer to the **Eterpan Stone Slip System** Installation Guide for the use requirements of the cladding system and the steel frame supplier recommendations on screw fixings.

2.8 **FLASHINGS**
 - **VentClad** proprietary uPVC window flashings and vermin barrier.
 - PBS aluminium Z flashings for inter-storey control joints.
 - **VentClad** meter box aluminium flashing kit.

2.9 **JOINTERS, HORIZONTAL AND VERTICAL**
 - **VentClad** one piece uPVC jointer.
 - **VentClad** uPVC control joint extrusion.
 - **XpressClad** XHR profile for window detail option at head and as alternative solution at floor joint.

2.10 **POLYPROPYLENE TAPE**
 10mm wide polypropylene tape to support non rigid air barriers.

Accessories

2.11 **TAPES**
 - Protecto Sill tape for window flashings to BRANZ Appraisal 444
 - 80mm wide Butyl Tape and Primer.
 - 10mm wide polypropylene tape to support non rigid air barriers.

2.12 **SEALANT**
 Bostik SAFETECH SAFEFIX building sealant to BRANZ Appraisal 705

Finishing materials

Refer to the specifications of the manufacturer of stone and brick slips for weather tightness, typical joint solution, adhesive system and specification of stone / brick slips.

3. EXECUTION

Conditions

3.1 STORAGE

Take delivery of sheets dry and undamaged in pallets and lay horizontally on a smooth level surface. Protect edges and corners from damage and cover to keep dry until fixed.

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.

3.3 SUBSTRATE

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

Application - particular installations

3.5 FIRE RESISTANCE RATING

Fix sheets to **Eterpan** technical information.

Refer to the sheet manufacturer's technical information for special conditions and limitations.

Application - generally

3.8 FIX BUILDING WRAP

Run and fix building wrap in full height rolls to wall framing, with fixing and end laps to NZS 3604 and the building wrap manufacturer's requirements. Repair all tears and cuts with duct tape or replace with new building wrap. To retain the wall insulation from bulging the building wrap into the cavity staple 19mm polypropylene tape vertically between the studs or horizontally between the nogs.

3.10 PENETRATIONS

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

- wall cladding underlay/building wrap taped to openings, finished and dressed off ready for the installation of window and door frames and other penetrations. Refer to guidelines for preparation of openings.
- claddings neatly finished off to all sides of openings.
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- Install **VentClad** meter box flashing kit to manufacturer's details.

3.11 BATTENS

Install horizontal battens to top and bottom plates, window and door heads and sills. Cut and fit vertical battens at 600mm centres and at all sheet joints. Cut and fit horizontal battens over nogs. Tack with 40mm clouts. Fit jamb and sill battens 10mm back from the finished opening. Install floating battens at mid floor horizontal control joints, or use alternate detail with PBS XHR rail.

Application – base for stone / brick slips

3.12 INSTALL CLADDING SHEETS

Cut sheets dry, form holes and work sheets to the stone / brick slips manufacturer's requirements. Fit control joints at 5.4 metre maximum centres to limit flush areas to 25

m² and vertical structural expansion joints at 10.8 metre centres. Finalise location and form of control and expansion joints on site before commencing cladding work.

The jointing of sheets must be undertaken by the applicator of the stone / brick slips system, so specify jointing work with the selected coating in the appropriate section.

3.13 FINISH VENTCLAD BASE FOR STONE SYSTEM

Completion

- 3.14 **CLEANING**
Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

4. SELECTIONS

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

4.1 BUILDING WRAP

Brand: PBS Tekton (or other approved by PBS Distributors Ltd)
Flashing tape: Protecto sill tape
PBS Butyl tape

4.2 FLUSH JOINT CLADDING SHEETS

Manufacturer: **Eterpan Base**
Thickness: 9.0mm
Location: Refer to drawings

4311 PROFILED METAL ROOFING

1. GENERAL

This section relates to the supply and fixing of proprietary overlap rigid sheet metal profiled roofing complete with accessories.

1.1 RELATED WORK

Refer to 4312 PROFILED PLASTIC ROOFING for plastic sheeting

Refer to 7411 RAINWATER SPOUTING SYSTEMS for rainwater disposal

1.2 ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silyl

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
NZS 2295	Pliable, permeable building underlays
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - Materials
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

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

5 years:	from the date of completion of the roof
Form:	Roofing installers standard form

Include a copy of the roofing manufacturers' maintenance requirements with the warranty. Refer to the general section 1237 WARRANTIES - INSTALLER/APPLICATOR for additional requirements.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

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

15 years	For failure of coating adhesion
15 years	For weatherproofing by material penetration
Form:	Roofing manufacturers standard form

Requirements

1.6 QUALIFICATIONS

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

Performance

- 1.7 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.
- 1.8 PERFORMANCE
Accept responsibility for the weather-tight performance of the completed roofing system, including penetrations through the roof and junctions with walls and parapets.
- 1.9 FIXINGS, WIND
Design and use the fixings appropriate for the design loads of this site; refer to general section 1220 PROJECT for details of wind zone. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

Performance - Wind (design by contractor)

- 1.10 DESIGN PARAMETERS - NON SPECIFIC DESIGN
Design the installation to the wind zone parameters of [NZS 3604](#), table 5.4. Refer to general section 1220 PROJECT for details.

2. PRODUCTS

Materials

- 2.1 WIRE NETTING AND SAFETY MESH
Refer to 4161 UNDERLAYS, FOIL AND DPC.
- 2.2 UNDERLAY AND REFLECTIVE FOIL
Refer to 4161 UNDERLAYS, FOIL AND DPC.
- 2.3 INSULATION
Refer to appropriate insulation section.
- 2.4 GALVANIZED STEEL, UNPAINTED
Formability G550 steel sheet coated to AS 1397.
- 2.5 HOT-DIPPED ALUMINIUM/ZINC COATED STEEL, UNPAINTED
Formability G550 steel sheet coated to AS 1397.
- 2.6 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL
Formability G550 steel sheet coated to AS 1397.
- 2.7 HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL, UNPAINTED
Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.
- 2.8 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL
Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.
- 2.9 ALUMINIUM
Aluminium alloy series 5000 temper H16 or H18 to suit application.
- 2.10 COPPER
Half-hardened commercial finished.
- 2.11 ZINC
Pure Zinc finished as required, 0.70mm BMT.

Components

- 2.12 **FLASHINGS GENERALLY**
To E2/AS1, 4.0 **Flashings**.
Formable grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, and 0.9mm 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.
- 2.13 **FLASHINGS TO VERGE, RIDGE AND HIP**
Supplied by the roofing manufacturer to match or to suit the roofing in the same material as the roof.
- 2.14 **BOOT FLASHINGS**
Generally to E2/AS1, 8.4.17 **Roof penetrations** (note; E2/AS1, Figure.54 **Soaker flashing for pipe penetration**, has an error, use as guide only).
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.

Fixings

- 2.15 **FASTENERS GENERALLY**
Minimum Class 4 and durability not less than the roofing material being fixed. Screw fasteners to be head stamped identifying the manufacturer and class.
- 2.16 **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 Class 4 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm.
- 2.17 **RIVETS**
Sealed aluminium, minimum diameter 4mm, for use with zinc coated, zinc/aluminium coated or aluminium roofing.

Accessories

- 2.18 **SEALANT**
Neutral Curing silicone or MS polymer sealant as required by the roofing manufacturer and used as directed.
- 2.19 **CLOSURE STRIPS**
Compressible, closed cell profiled foam strips to fit the sheet profile.
- 2.20 **LAP SEALING TAPE**
Closed cell self adhesive nitrile 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**
When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

- 3.3 **STORAGE**
Take delivery of and accept packs of roofing undamaged on delivery. Reject all damaged material. Store on a level firm base with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air movement between sheets.
- 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, also 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 oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.
- 3.7 **END LAPS**
End laps are not permitted, except where specifically detailed.
- 3.8 **MOVEMENT JOINTS**
Fixing and jointing to conform with the roofing manufacturer's requirements for thermal movement.
Over timber framing, transverse flashings (those running long continuous framing members) to have expansion joints at maximum 12 centres.
- 3.9 **FIXING GENERALLY**
Install and fix in accordance with the [NZMRM CoP](#) requirements, and to roofing manufacturer's recommendations. Paint colour matched fixings and accessories before installation.
- 3.10 **MARKING AND CUTTING**
Cut only by shearing tools. Do not use black lead pencils for marking aluminium/zinc coated products.
- 3.11 **FIX SHEETS**
Fix sheets in place using the fastening system required by the roofing manufacturer for specified profiles, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.
- 3.12 **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.
- 3.13 **FLASHINGS**
Flash roof to parapets, walls and penetrations to detail. Where no detail is provided flash to [NZMRM CoP](#) recommendations and the roofing manufacturer's requirements. Cut accurately and fix using sealant and rivets to detail and to the roofing manufacturer's requirements to form a weatherproof cover. For highly visible flashings, plan joints/junction to take account of the aesthetic requirements.
- 3.14 **USE OF SEALANTS**
Select and use sealants only as recommended by the roofing manufacturer. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

- 3.15 **FLASHING PENETRATIONS**
Flash all penetrations through the roof. Fit 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.

- 3.16 **INSTALL RIDGING**
Install ridging by fastening to the purlins through the leading edge of the roofing to manufacturer's requirements.

Completion

- 3.17 **REPLACE**
Replace damaged or marked elements.
- 3.18 **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.
- 3.19 **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 spoutings, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

4. SELECTIONS

Roofing

- 4.1 **PROFILED METAL ROOFING PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL**
Brand/profile: As Selected by builder
BMT: 0.4mm or thicker as selected
Coating grade: As Selected by builder
Colour: As selected

Accessories

- 4.2 **FLASHING**
Material/thickness: As selected by builder
- 4.3 **FLASHING - INACCESSIBLE**
Material/thickness: 0.75mm

4521 ALUMINIUM WINDOWS AND DOORS

1. GENERAL

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

- aluminium windows
- aluminium doors and frames
- hardware and furniture
- overhead glazing
- flashings

1.1 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of Zealand
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 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
WANZ Installation Guide:	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 6.
WANZ PQAS	Powder Coating Quality Assurance System
WANZ SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005).
BRANZ BU 337	Protecting Window Glass from Surface Damage
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.
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)

Warranties

- 1.3 **WARRANTY - MANUFACTURER/SUPPLIER**
Provide a material manufacturer/supplier warranty:
5 years: For fabrication
Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

1.4 **WARRANTY - INSTALLER/APPLICATOR**

Provide an installer/applicator warranty:
2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 **QUALIFICATIONS**

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

1.6 **COMPLIANCE**

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

1.7 **SHOP DRAWINGS**

Shop drawings to show the general arrangement of the aluminium joining including, but not be limited to:

Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including: -

- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Interaction between claddings and linings
- Flashing details
- Sealants and air seals
- Non standard fixing details including bracketing

And where required the following:

- Design calculations
- Producer Statement in the form PS1 Producer Statement Design
- Rebate sizes
- Dimensions of all typical elements and of any special sizes and shapes
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of windows and doors
- Sealant types and full size sections of all sealants and backing rods
- Provision for thermal movement
- Provision for seismic movement and movement under wind loads
- Sequence of installation
- Glazing specification and details

Where requested provide the following additional information

- Information of Professional Indemnity Insurance held by the person providing the shop drawings

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

Complete shop drawing review before commencing fabrication.

1.8 **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

1.9 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.

1.10 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

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

Performance - Wind (design by contractor)

1.11 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of [NZS 3604](#), table 5.4.

Refer to SELECTIONS for wind zone.

Finishes

1.12 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

Materials

2.1 WINDOWS

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

2.3 ALUMINIUM EXTRUSIONS

Alloy designation to comply with [AS/NZS 1866](#). Branded and extruded for anodising or powder coating.

2.4 ALUMINIUM SHEET AND STRIP

Complying with [AS/NZS 1734](#) of suitable thickness. Rolled for anodising or powder coating.

Alloy designation: 5251 - H16 or 5005 - H16

2.5 GLASS

Refer to the glazing section for glass types and installation.

2.6 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

2.7 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 cavity systems

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

- 2.9 **WANZ SUPPORT BAR**
Extruded aluminium support bar with built in drainage and ventilation to [NZBC E2/AS1](#), to provide continuous support to the window unit. Size to suit cladding type.

Components

- 2.10 **GLAZING GASKETS**
Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.
- 2.11 **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.
- 2.12 **SAFETY STAYS**
Stainless steel non releasable restrictors to limit window opening to [NZBC F4/AS1](#), Table 2, Acceptable opening sizes for barriers.

Sealants

- 2.13 **STRUCTURAL SEALANT**
Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a $\pm 40\%$ movement factor complying with US Federal Specification TT S 001543A.
- 2.14 **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.
- 2.15 **FOAM TAPE**
Foam tape to [NZBC E2/AS1](#), 9.1.10.7 **Closed cell foam tape.**

Finishes

- 2.16 **POWDER COATED ALUMINIUM - EXTRA DURABLE**
Polyester powder organic coating in accordance with [WANZ PQAS](#) and AS 3715.
- 2.17 **POWDER COATED ALUMINIUM - HIGH DUTY**
Polyester powder coating in accordance with [WANZ PQAS](#) and AAMA 2604.

3. EXECUTION

Conditions - generally

- 3.1 **DO NOT DELIVER**
Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.
- 3.2 **UNLOAD WINDOW JOINERY**
Unload, handle and store elements in accordance with the window manufacturer's requirements.
- 3.3 **AVOID DISTORTION**
Avoid distortion of elements during transit, storage and handling.

- 3.4 **PREVENT DAMAGE**
Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

- 3.5 **PROPRIETARY ELEMENTS**
Fix in accordance with the window manufacturer's requirements.

- 3.6 **PROTECTIVE COVERINGS**
Retain protective coverings and coatings to BRANZ BU 337 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.

- 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 **CORROSION PROTECTION**
Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

- 3.15 **CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS**
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to [NZBC E2/AS1:9.1.5 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).

3.16 INSTALLATION

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

3.17 INSTALLATION CAVITY CONSTRUCTION

Install to [WANZ Installation Guide](#) details and drawings including WANZ 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).

3.18 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm minimum plus any jamb scribe width at each end.

3.19 COMPLETE AIR SEAL

To [NZBC E2/AS1:9.1.6 Air seals](#). Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE

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

3.22 PREPARE JOINTS

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

3.23 BACK UP

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

3.24 SEALANT FINISH

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

Completion - cleaning

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

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

Completion

- 3.27 PROTECTIVE COVERINGS
Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades.

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

- 3.29 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM
In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted only to minor surface scratching. Otherwise replace all damaged material.

- 3.30 REMOVE
At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

- 3.31 REPLACE
Replace damaged, cracked or marked elements.

- 3.32 MANIFESTATIONS
Apply manifestations to comply with [NZS 4223.3](#), 303.1 Manifestations.

4. SELECTIONS

Performance

- 4.1 THERMAL PERFORMANCE
R-value: R0.26 (as determined from [NZBC H1](#)/VM1 or H1/AS1)

Performance - Wind (design by contractor)

- 4.2 WIND - NON SPECIFIC DESIGN
Building wind zone High (refer to [NZS 3604](#), table 5.4)

Window and door system

- 4.3 ALUMINIUM WINDOWS
Manufacturer: As selected by client / builder
Type/location: Refer Drawings

- 4.4 WINDOW AND DOOR REVEALS - TIMBER
Timber species: Radiata Pine
Grade/treatment: H3.1
Thickness: 19mm
Reveals: Grooved
Finish: FJ Pine

Finishes

4.5 POWDER COATING FINISH

Type: powder coating
System integrity: as per manufacturers specifications
Thickness: Average of 80 microns with a minimum of 50 microns
Colour: as selected by client

4.6 FLASHINGS

Material/type: to match joinery
Pattern: Formed to suit details provided

4.7 WEATHERING SEALANT

Brand/type: 1-part polyurethane moisture curing, elastic joint sealant
Colour: to suit joinery

4.8 HARDWARE

	Brand/style	Material/finish
Sash fasteners:	as selected by client	
Door furniture:	as selected by client	

4710P PINK® BATTS® & PINK® BATTS® SILENCER® INSULATION

1. GENERAL

This section relates to Tasman Insulation **Pink® Batts®** insulation materials installed into residential buildings.

It includes:

Thermal:

- **Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**

Documents

1.1 DOCUMENTS

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

- [NZBC C/AS1-AS6](#) Protection from fire
- [NZBC H1/AS1](#) Energy efficiency
- [NZS/AS 1530.1](#) Methods for fire tests on building materials, components and structures - Combustibility test for materials
- [AS/NZS 3000](#) Electrical installations
- [NZS 4218:2004](#) Energy Efficiency - Small building envelope
- [NZS 4220](#) Code of practice for energy conservation in non-residential buildings
- [NZS 4243.1](#) Energy Efficiency - Large buildings - Building thermal envelope
- [NZS 4246](#) Energy efficiency - Installing bulk thermal insulation in residential buildings
- [AS/NZS 60598.2.2:2001](#) Luminaires- Particular Requirements - Recessed luminaires
- [AS/NZS 60695.11.5](#) Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Tasman Insulation New Zealand: Product Data Sheets and Installation Instructions

- [BRANZ Appraisal 238](#) - Pink® Batts® Insulation
- [BRANZ Appraisal 632](#) - Pink® Batts® SnugFloor® Underfloor Insulation
- [BRANZ Appraisal 767](#) - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company: **Tasman Insulation New Zealand**

Web: www.pinkbatts.co.nz

Telephone: 0800 746 522

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

Lifetime Warranty	For Pink® Batts® insulation products
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- Commence the warranty from the date of practical completion of the contract works.
- Provide this Warranty on the **Pink® Batts® Lifetime Warranty Certificate** form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS, PINK® BATTS®

Installers to be **PinkFit® - Preferred Pink® Batts® installers**. A list of approved installers can be obtained from the web, by telephone or from the local building supplies merchant.

Web: www.pinkbatts.co.nz

Telephone: Freephone 0800 746 534

- 1.5 NO SUBSTITUTIONS
Substitutions are not permitted to any specified Tasman Insulation **Pink® Batts®** insulation or associated products, components or accessories.

2. PRODUCTS

Materials - thermal

- 2.1 PINK® BATTS® CEILING INSULATION
Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.
NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaries the insulation must withstand a 30s Needle Flame test to [AS/NZS 60695.11.5](#). Pink® Batts® insulation meets this requirement.
- 2.2 PINK® BATTS® WALL INSULATION
Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.

Components

- 2.3 FASTENERS
Insul anchors complete with retaining washer.
- 2.4 TAPES
Proprietary plastic tape stapled across framing to retain insulation in unlined wall and ceiling locations.
- 2.5 ADHESIVE TAPE
Pressure sensitive adhesive tape.

3. EXECUTION

- 3.1 STORAGE
Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, compression, puncturing and damage to edges of materials. Do not use damaged or wet insulation materials.
- 3.2 HANDLING
Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.
- 3.3 INSPECTION
Before starting installation of blankets and slabs, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall underlays and vapour barriers are in place.

Application - general

- 3.4 INSTALL INSULATION - GENERAL
Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#) and [NZS 4220](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Confirm with fireplace manufacturer for clearances; **Pink® Batts®** insulation need not be separated except if used in conjunction with, or

attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.5 RECESSED LIGHT FITTINGS - CLEARANCE

Non-residential applications;

The clearance between insulation and recessed downlights

- 100mm gap to [AS/NZS 3000](#), figure 4.9.
- Provide larger clearances where required by the light 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 clearance where required by the light manufacturer.
- In a retrofit situation where recessed downlights are unclassified or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

Application, thermal insulation

3.6 INSTALL PINK® BATTS® CEILING INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Ceiling Insulation** beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the **Pink® Batts®** insulation and roof underlay. Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

3.7 INSTALL PINK® BATTS® WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

Completion

3.8 CLEAN UP

Clean up as the work proceeds, so no spare offcuts or any other matter or item remain behind claddings or linings.

3.9 LEAVE

Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

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

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

Thermal insulation

4.1 PINK® BATTS® CLASSIC CEILING INSULATION

Location: Ceiling

Brand: **Pink® Batts® Classic Ceiling**

R-value: 3.6
Thickness: 180mm

- 4.2 PINK® BATTS® CLASSIC WALL INSULATION
Location: Walls
Brand: **Pink® Batts® Classic Wall**
R-value: 2.4
Thickness: 90mm

5113 PLASTERBOARD LININGS

1. GENERAL

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

- standard systems
- superior finish quality systems
- wet area systems
- bracing systems
- minor related fire rating
- minor related sound rating

1.1 ABBREVIATIONS

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

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

[NZBC C/AS1-AS7](#) 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](#) 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.

Requirements

1.3 QUALIFICATIONS

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

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

Performance

1.4 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:

- before applying sealer and
 - before applying finish coatings or decorative papers,
- so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

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, WATER RESISTANT SYSTEMS
Gypsum plaster core containing a wax emulsion encased in a durable face and backing paper formed for standard and fire rated use to [AS/NZS 2588](#) and for water resistance use to ASTM C630/C630M-96a.

- 2.3 CORNICE
Plasterboard, scotia pattern.

Components

- 2.4 CEILING BATTENS, METAL
0.55mm galvanized steel (275 g/m² zinc coating) battens and matching perimeter channels.

- 2.5 SCREWS, TIMBER FRAME

10mm plasterboard:	Type S gypsum screws 25mm x 6 gauge
13mm plasterboard:	Type S gypsum screws 32mm x 6 gauge

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

- 2.6 NAILS, TIMBER FRAME

10mm plasterboard:	30mm x 2.5mm galvanized drywall clouts
13mm plasterboard:	40mm x 2.5mm galvanized drywall clouts

Nails for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.
Nails for perimeter nailing for bracing systems complete with 15mm galvanized steel washers as required by the sheet manufacturer's approved specification.

- 2.7 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.

- 2.8 EXTERNAL ANGLE
Perforated.

- 2.9 INTERNAL REINFORCING ANGLE
Perforated.

- 2.10 CONTROL JOINT
With plastic protective tape.

- 2.11 CASING BEAD
To suit sheet thickness.

- 2.12 J MOULD
Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25mm x 1.6mm nickel panel pins.

- 2.13 TAPE ON EDGE TRIMS
Tape-on paper tape and galvanized steel trims and edges.

- 2.14 EDGE PROFILES
Pre-formed aluminium profiles, with perforated edge trims.

Accessories

- 2.15 **ADHESIVE**
Multi-purpose water based wallboard adhesive.
- 2.16 **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.
- 2.17 **JOINTING TAPE**
System match reinforcing tape.

3. EXECUTION

Conditions

- 3.1 **STORAGE**
Store plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material.
- 3.2 **SUBSTRATE**
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements.
- 3.3 **TIMBER FRAME MOISTURE CONTENT**
Maximum allowable moisture content to [AS/NZS 2589](#) for timber framing at lining is 18% or less for plasterboard linings.
- 3.4 **PROTECTION**
Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.
- 3.5 **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

- 3.6 **INSTALL CEILING BATTENS**
Install in accordance with the batten manufacturer's requirements.
- 3.7 **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.
- 3.8 **BOARD ORIENTATION**
Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.
- 3.9 **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 - wet area systems

- 3.10 **LINE WET AREA WALLS**
Line walls in accordance with the sheet manufacturer's requirements.

Application - finishing sections and trim

- 3.11 **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.
- 3.12 **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.
- 3.13 **FIX CASING BEAD**
Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.
- 3.14 **FIX J MOULD**
Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.
- 3.15 **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.
- 3.16 **FIX COVER MOULDS**
Fix to the sheet manufacturer's details and requirements and to the drawings supplied.
- 3.17 **FIX CORNICE**
Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements
- 3.18 **FORM SQUARE STOPPED CORNERS**
Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.
- 3.19 **INSTALL TAPE-ON TRIMS**
Install in accordance with the trim manufacturer's requirements.
- 3.20 **INSTALL SPECIAL EDGES AND BANDS**
Install in accordance with the edging manufacturer's requirements.

Finishing - stopping

- 3.21 **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.
- 3.22 **STOPPING NAILS AND SCREWS**
Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.
- 3.23 **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.
- 3.24 **EXTERNAL ANGLES**
Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.
- 3.25 **END BUTT JOINTS**
Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

Completion

- 3.26 REPLACE
Replace damaged sheets or elements.
- 3.27 CLEAN DOWN
Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean to the standard required for following trades.

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

4. SELECTIONS

- 4.1 STANDARD SYSTEMS - WALLS
Location: Refer Plans
Type/thickness: 10mm Standard
Finish: Level 4

- 4.2 STANDARD SYSTEMS - CEILINGS
Location: Refer Plans
Type/thickness: 10mm Standard
Finish: Level 4

Accessories

- 4.3 CEILING BATTENS
Brand/type: 35mm metal
- 4.4 CORNICE
Brand/type: As selected by Builder
Size: 55mm
- 4.5 TAPE ON EDGE OR CORNER TRIMS
Brand/type: Brand Matched

5230 INTERIOR DOORS

1. GENERAL

This section relates to the supply and installation of interior doors.

1.1 DOCUMENTS

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

[NZS 3602](#)

Timber and wood-based products for use in building

[NZS 3610](#)

Specification form profiles of mouldings and joinery

2. PRODUCTS

2.1 TIMBER

To [NZS 3602](#).

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to [NZS 3610](#). Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

2.3 DOORS, PAINTED

Doors as scheduled (without clashing strips).

2.4 CAVITY SLIDERS

Doors hung within a proprietary cavity slider frame and complete with brand-matched sliding door gear.

2.5 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

3. EXECUTION

3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

3.2 EXECUTION GENERALLY

Manufacture to the methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -
- Hinges

3.4 FACTORY FINISHING

Before delivery to site: -
- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

Internal doors

3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

3.6 DOOR FRAMES, SOLID REBATED
Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.7 DOOR LINERS
Heads and jambs finished minimum 18mm, with 10mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.8 DOOR LINERS, EXTENDED
Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.9 CAVITY SLIDERS
Install in accordance with the door manufacturer's requirements, allowing for removal of top trim for maintenance.

Completion

3.10 CHECK
Check and adjust operation of all sashes, doors, hardware and furniture.

3.11 TEMPORARY PROTECTION
On completion remove any temporary protection and leave ready for following work.

4. SELECTIONS

4.1 HOLLOW CORE DOOR, PAINT FINISH
Brand/type: As selected by builder

4.2 CAVITY SLIDER
Brand/type: CS Sliders

Accessories

4.3 DOOR HINGES
Interior doors

Type:	Loose pin
Size:	89mm
Material:	Zinc-plated steel
Pin:	Loose-pin zinc-plated steel

6221 FLOOR TILING

1. GENERAL

This section relates to the supply and installation of ceramic floor tiles.
It includes:

- concrete substrates
- timber substrate floors
- timber floor overlays

1.1 RELATED WORK

Refer to 6211 WALL TILING for wall tiling.

Documents

1.2 DOCUMENTS

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

NZBC D1/VM1	Access routes
NZBC D1/AS1	Access routes
NZBC E3/AS1	Internal moisture
AS/NZS 3661.1	Slip resistance of pedestrian surfaces - Requirements
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4671	Steel reinforcing materials
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BRANZ	Good practice guide: Tiling

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
2years: 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:
2 years: For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS

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

1.6 NO SUBSTITUTIONS

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

- 1.7 **DEFLECTION CRITERIA FOR SUSPENDED FLOORS**
Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

- 1.8 **ADHESIVES COMPATIBILITY**
Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

- 1.9 **PROVIDE SPARE TILES**
Provide spare tiles. Refer to SELECTIONS for type and quantity.

Performance

- 1.10 **SLIP RESISTANCE FOR ACCESS ROUTES**
Slip resistance for tiles to comply with [NZBC D1](#)/AS1: 2.0 Level access routes and 3.0 Ramps.
- when in place on a level access route, to have a mean coefficient of friction (μ) not less than 0.4 when tested in accordance with [AS/NZS 3661.1](#).
- when in place on a sloping access route, to have a coefficient of friction (μ) not less than $0.4 + 0.0125S$ (S = slope of surface expressed as a percentage).
- 1.11 **PROVIDE EVIDENCE OF SLIP RESISTANCE**
Provide evidence that the tiles comply with the standard of performance specified.
- 1.12 **CERTIFY SLIP RESISTANCE**
Provide certificates and any other evidence at the time of selection/supply that the tiles comply with [NZBC D1](#)/VM1 and [NZBC D1](#)/AS1: Access routes.

2. PRODUCTS

Materials

- 2.1 **FLOOR TILES**
Refer to SELECTIONS for product selection.
- 2.2 **REINFORCING MESH**
To [AS/NZS 4671](#), galvanized 500mm x 500mm x 2.5mm.
- 2.3 **SEPARATING LAYER**
Single layer heavy gauge polyethylene film.
- 2.4 **BUILDING UNDERLAY**
Breather type bitumen saturated kraft paper.
- 2.5 **UNDERFLOOR HEATING**
Refer to appropriate underfloor heating section for electric undertile heating system.

Components

- 2.6 **EXPANSION JOINT, METAL AND RUBBER**
Clear anodised aluminium/brass with metal anchor to set into in-situ concrete, cement screed/bed and complete with rubber infill.
- 2.7 **EXPANSION JOINT, METAL AND COMPOUND**
Aluminium/brass angles with high density foam rubber insert and jointing compound.
- 2.8 **EXPANSION JOINT, PLASTIC**
Rigid stabilised PVC sides with flexible central section.

Accessories

- 2.9 **SCREED**
Mix of 3:1 Portland cement, coarse washed sand gauged with liquid polymer additive to the tile manufacturer's stated requirements.
- 2.10 **CEMENT MORTAR**
Sand and cement bedding coat with liquid polymer additive, to the tile manufacturer's stated requirements.
- 2.11 **SHEET WATERPROOFING MEMBRANE**
Proprietary sheet waterproofing system.
- 2.12 **LIQUID WATERPROOFING MEMBRANE**
To AS 3740.
- 2.13 **TILE ADHESIVE**
To AS ISO 13007.1.
- 2.14 **SAND AND CEMENT GROUT**
1 part Portland cement to 2-3 parts fine, washed sand, mixed to a paste consistency with a minimum of clean, potable water.
- 2.15 **PROPRIETARY GROUT**
Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.
- 2.16 **MOVEMENT JOINT SEALANT**
To BRANZ Good practice guide: Tiling, section 5.0.
- Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
- Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.
Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

3. EXECUTION

- 3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish
- 3.2 **CHECK TILES**
Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.
- 3.3 **CONFIRM LAYOUT**
Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.
- 3.4 **SETTING OUT**
Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.
- 3.5 **GENERALLY**
Prepare surface and complete tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

Conditions

3.6 SERVICES AND ACCESSORIES

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.7 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will achieve tile laying of the required standard.

3.8 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.9 MOISTURE CONTENT

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less.

3.10 SCREEDS

Form screeds with a deviation from plane of not more than 5mm over 3 metres.

3.11 FALLS

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5mm over 3 metres. Unless otherwise specified form screeds with the following falls:

Unless stated otherwise provide minimum fall gradients to BRANZ Good Practice Guide - Tiling, clause 6.5 Falls in floors.

- 1 : 40 minimum For tiled decks which also acts as a roof
- 1 : 60 minimum For paving over ground
- 1 : 50 minimum For unenclosed shower bases (to [NZBC E3/AS1](#), 3.3.5)
- 1 : 60 minimum For enclosed shower bases
- 1 : 50 minimum For shower bases for people with disabilities (to [NZS 4121](#), 10.5.11.3 (b).)
- 1 : 60 minimum For commercial kitchens or similar

Application - preparing new surfaces

3.12 CONCRETE FLOORS

Completely remove surface contaminants such as paints, oils, release and curing compounds. Remove projections, unevenness and loose material to leave a clean dust and dirt free surface.

Movement joints

3.13 MOVEMENT JOINTS

Provide movement joints with a minimum width of 4mm, carried through tile and bedding and where substantial movement is anticipated, through the rigid sheet to the structure. Install joints over expansion joints, at junctions between different backgrounds, abutting other materials, at internal corners and at junctions with floors and columns. Ensure joints are clean, formed, filled and with sealant inserted to the sealant manufacturer's requirements.

3.14 METAL EXPANSION JOINT

Accurately locate and fix joints in situ, with the bedding, or on top of the bedding, to finish flush with the installed tile and to the tile manufacturer's requirements. Fit and fix rubber/rubber compound inserts to finish flush. Fit expansion joints at regular intervals over the floor area at intervals not exceeding 4 metres, at changes in floor plane and where the floor plane is interrupted.

Waterproofing

- 3.15 **INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS**
Install waterproofing membrane to manufacturers requirements and to BRANZ Good tiling practice, 7.0 Waterproofing interior wet areas. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide: Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install waterproof membranes as follows:

Unenclosed shower cubicle

- To 1800mm above floor and 300mm above shower rose.
- To at least 1500mm from shower rose.
- To the floor within 1500mm of the shower rose.

Bath with a shower over and no shower screen

- To 1500mm from the shower rose and top edge.
- To 1800mm above base of bath.
- To the floor within 1500mm of the shower rose.

Bath with shower over and a screen for the shower

- To 1800mm height around sides of bath.

Bath

- To 150mm minimum around the sides and along walls horizontally 150mm minimum.

Splashback to a vanity

- To 300mm minimum up wall behind the vanity.
- To the floor level at least twice the width of the vanity and 500mm min beyond it at each end.

Undertile heating

- 3.16 **INSTALL UNDERTILE HEATING**
Refer to the appropriate underfloor heating section for electric undertile heating system.

Application - tile installation

- 3.17 **BONDED CEMENT MORTAR**
Apply proprietary cement slurry bond coat over the whole of the floor to the tile manufacturer's requirements. Thoroughly mix and place the 40mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. Apply proprietary cement slurry bond coat to the wet mortar bed and set tiles while still tacky, firmly beating into the bedding and aligning the 3mm tile joints at the same time.
- 3.18 **MODIFIED CEMENT BASED ADHESIVE**
Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.
- 3.19 **MODIFIED CEMENT BASED ADHESIVE AND WATERPROOF MEMBRANE**
Apply appropriate waterproof membrane to manufacturer's requirements. Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.
- 3.20 **PLASTER SCREED AND SEPARATING LAYER**
Lay polyethylene sheet/building underlay to a smooth surface, joints lapped 100mm minimum. Place galvanized steel mesh over with spacers to centralise it in the mortar bed. Thoroughly mix and place the proprietary screed mix to the manufacturer's requirements and compact to the required level. Ensure drying times are observed before installation of tiles by thin/thick set method.

- 3.21 **EXPANSION JOINT, COMPOUND**
Provide expansion joints; at 4 metre intervals, at the perimeter of floors, at changes of level and around structural features. Carefully clean out the joint, insert the backing rod and fill with compound placed by gun. After the correct interval, finish the surface off flush to the compound manufacturer's requirements.

Grouting

- 3.22 **APPLY GROUTING**
Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to depth of cushion and flush with surface to cushion edge and square-edge tiles. Remove surplus grout with a damp sponge and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

- 3.23 **APPLY PROPRIETARY GROUTING**
Remove spacers. Prepare joints, mix and apply grout and finish off to the grout manufacturer's requirements, to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

Cleaning

- 3.24 **CLEAN TILES**
Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

- 3.25 **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.
- 3.26 **DEFECTIVE OR DAMAGED WORK**
Repair damaged or marked tiles. Replace damaged or marked tiles where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting.
- 3.27 **PROTECTION**
Provide the following temporary protection of the finished work:
Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

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

Materials

- 4.1 **CERAMIC AND STONE TILES**
Location: Refer to drawings
Manufacturer: As selected
Tile size: As selected
Colour: As selected
Edging: As selected
Grout width: 3mm
- 4.2 **SCREED**
Location: Refer to drawings
Manufacture: As supplied by tiler in accordance with AS 3958

4.3 WET AREA TILE ADHESIVE
Location: Refer to drawings
Manufacturer: As supplied by tiler in accordance with AS ISO 13007.1 and AS ISO 13007.3

4.4 TILE ADHESIVE
Location: Refer to drawings
Manufacturer: As supplied by tiler in accordance with AS ISO 13007.1 and AS ISO 13007.3
Trade name/number: ~

4.5 PROPRIETARY GROUT
Location: Refer to drawings
Manufacturer: As supplied by tiler in accordance with AS ISO 13007.1 and AS ISO 13007.3
Colour: To suit selected tile

Components

4.6 LIQUID WATERPROOFING MEMBRANE
Location: Refer to drawings
Brand/type: Approved product as selected by tiler

6411 VINYL SURFACING

1. GENERAL

This section relates to the supply and installation of vinyl surfacing including skirtings, nosings, trims and edges.

It includes:

- PVC sheet
- PVC tiles

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-AS7](#) Protection from fire
- [NZBC D1/VM1](#) Access routes
- [NZBC D1/AS1](#) Access routes
- [NZS/AS 1884](#) Floor coverings - Resilient sheet and tiles - Installation practices
- [AS/NZS 3661.1](#) Slip resistance of pedestrian surfaces - Requirements
- BRANZ BU 330 Thin flooring materials - 2 Preparation and laying

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

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

1.5 NO SUBSTITUTIONS

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

2. PRODUCTS

Materials

2.1 VINYL SHEET

High vinyl content homogeneous monolayer flexible PVC sheet flooring.

2.2 COVINGS

- | | |
|--------------------------|--|
| Commercial applications: | Pencil cove with butterfly mitres to all external and internal corners. Fillet cove for safety flooring. |
| Domestic applications: | Pencil or fillet cove method. |

2.3 WALL AND FLOOR VINYL JOINING STRIP

White PVC floor to wall finishing strip.

2.4 TRIMS AND EDGING

PVC as supplied by the sheet manufacturer to complete the work.

Accessories

2.5 ADHESIVE

Standard acrylic adhesive to suit the material and substrate and to the vinyl manufacturer's requirements.

2.6 PRIMER AND SEALER

To the adhesive manufacturer's requirements for the particular substrate.

3. EXECUTION

Conditions

3.1 GENERALLY

To manufacturer's requirements and [NZS/AS 1884](#).

3.2 STORAGE

Maintain rolls of sheet, packages of tiles and accessories undamaged and dry. Store rolls upright with other material on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.

3.3 HANDLING

Avoid distortion, stretching, marking and damage to edges while shifting, unrolling and handling sheet, tiles and accessories. Inspect for any faulty material. Do not use faulty or damaged material.

3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.5 INSPECT

Inspect the substrate to ensure it is of the standard required for work in this section.

3.6 LAYING

Carry out the whole of the work to [NZS/AS 1884](#), BRANZ BU 330 and to the flooring manufacturer's requirements.

3.7 LAYOUT

Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

Preparing substrate

3.8 NEW CONCRETE

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust. Check moisture content to [NZS/AS 1884](#), Appendix A and do not commence laying vinyl until readings for the whole area show 75% relative humidity or less..

Vinyl floor laying

3.9 PREPARATION

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for conditioning of rolls and the working temperatures and conditions before, during and after laying. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side, of the work period.

- 3.10 **ADHESIVE APPLICATION**
Apply approved adhesive as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.
- 3.11 **LAYING VINYL SHEET**
Roll out, cut, leave to condition and install sheet vinyl to the vinyl manufacturer's requirements. Ensure there are no air bubbles or twisting, that the seams are kept clear of adhesive, and immediately the sheet is adhered roll with a 68 kg roller.
- 3.12 **THERMO-WELDING VINYL SHEET**
Machine groove and thermo-weld all seams in specified areas, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.
- 3.13 **CROSS JOINS**
Plan and allow cuts to avoid cross joins. Obtain written approval of the owner before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.
- 3.14 **COVE VINYL**
Pencil cove flooring to the specified height and finish off as detailed.
- 3.15 **MITRES**
Perform butterfly method to internal and external mitres. Thermo-weld mitres.
- 3.16 **FIT VINYL EDGING**
Fit tapered vinyl edging to all borders, except where abutting carpet.
- 3.17 **APPLY PRIMER OR SEALER FOR VINYL SHEET**
Prime and/or seal porous plaster, concrete and timber substrates to the adhesive manufacturer's requirements.
- 3.18 **FLOOR TO WALL FINISHING STRIP**
Adhere to walls in a true, straight line using contact adhesive. Roll immediately using a seam-roller to ensure maximum bond strength is achieved.
- 3.19 **APPLY VINYL WALL SHEET**
Apply sheet to walls and heat weld seams under the technical direction of the wall sheet manufacturer's representative for each particular location.

Obtain written approval of the proposed joint layout approach from the owner, then adhesive fix either vertically or the T-method, ensuring all corners are wrapped and joints are no closer than 200mm to internal or external corners.

Cut vinyl neatly to recess on the floor/wall finishing strip and chemically weld this joint using Werner Mueller, type C welding compound.
- 3.20 **THERMO-WELD VINYL WALL SHEET**
Hand groove and thermo-weld all seams, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

Cleaning

- 3.21 **CLEAN VINYL**
Leave vinyl flooring surfaces free of adhesive, dirt and debris. Clean and finish vinyl to manufacturer's requirements.

Completion

- 3.22 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.
- 3.23 DEFECTIVE OR DAMAGED WORK
Repair damaged or marked vinyl flooring. Replace damaged or marked vinyl where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

4. SELECTIONS

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

Materials

- 4.1 VINYL SHEET
Location: Refer Drawings
Manufacturer/brand: As selected by Client

Components

- 4.2 FLOOR LEVELLING COMPOUND
Location: Any lower floor areas
Brand/type: As supplied by Floor Layer

6511 CARPETING

1. GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double stuck down.

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-AS7](#) Protection from fire

[AS/NZS 2455.1](#) Textile floor coverings - Installation practice - General

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Carpet layers to be experienced, competent trades people familiar with the materials and the techniques specified, and with [AS/NZS 2455.1](#).

1.5 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.

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.7 NO SUBSTITUTIONS

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

1.8 SAMPLES

Provide samples of each carpet for review of colour, design and quality. Submit on request samples of underlay and accessories offered.

- 1.9 RESERVE MATERIAL
Supply reserve carpet, all suitably packaged for delivery and storage. Refer to SELECTIONS.

2. PRODUCTS

Materials

- 2.1 UNDERLAY
To [AS/NZS 2455.1](#) Soft underlay and underlays manufacturer's requirements. Refer to SELECTIONS for product selection.
- 2.2 CARPET
To [AS/NZS 2455.1](#) Textile floor coverings. Refer to SELECTIONS for product selection.

Components

- 2.3 BINDER BARS
Anodised aluminium section with fluted face.
- 2.4 DIVIDER STRIPS
Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.
- 2.5 EDGE GRIPPER
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.

4. SELECTIONS

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

4.1 SELECTIONS

Location	Brand	Type/thickness/weight
Refer Drawings	As selected by Client	As selected by client

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/AS1-AS7	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
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	Painters hazard handbook
	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 CONTROL SAMPLES

Prepare samples of the finished work as scheduled, including preparation and colour as specified. Obtain written approval of the appearance before proceeding. Refer to SELECTIONS for requirements.

1.7 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 Painters hazard handbook. 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.

1.8 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties

1.9 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

Performance

1.10 MANUFACTURER'S INSPECTION

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.11 INSPECTION OF WORK

Inspection of the whole of the work at each of the stages scheduled may be made. Agree a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2. PRODUCTS

Materials

2.1 PAINT TYPES

Use the manufacturer's complete system and only the products specified.

2.2 MATERIALS GENERALLY

Use only the Manufacturer's products which are guaranteed for their consistency and performance under [AS/NZS ISO 9001](#) and APAS approval, prepared, mixed and applied as directed in the Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

Accessories

2.4 FILLERS

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified coating.

3. EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in [AS/NZS 2311](#), the MPNZA Specification manual, and WorkSafe 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 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.
- 3.9 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.
- 3.10 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

- 3.11 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.
- 3.12 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.
- 3.13 PREPARING ROUGH SAWN TIMBER
Thoroughly brush along the direction of the grain to remove dust and dirt.
- 3.14 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.
- 3.15 TIMBER SPECIES
Check that the preparation and paint system is suitable for the timber species.

- 3.16 **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.
- 3.17 **FIXINGS**
Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.
- 3.18 **CLEANING**
Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.
- Preparation - gypsum plaster**
- 3.19 **PREPARING GYPSUM PLASTER**
Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.
- Preparation - painted surfaces generally**
- 3.20 **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. Liberally 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:
 - 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.

6711 PAINTING EXTERIOR

1. GENERAL

This section relates to the preparation of exterior unpainted and pre-painted surfaces, and the application of exterior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

Warranties

1.2 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

2. PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3. EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4. SELECTIONS

Paint systems

4.1 ALL EXTERIOR PAINT SYSTEMS - AS SELECTED BY CLIENT / PAINTER TO MANUFACTURERS SPECIFICATIONS

6721 PAINTING INTERIOR

1. GENERAL

This section relates to the preparation of interior unpainted and pre-painted surfaces, and the application of interior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Documents

Warranties

1.2 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

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

2. PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3. EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4. SELECTIONS

**ALL INTERIOR PAINT SYSTEMS - AS SELECTED BY CLIENT / PAINTER TO
MANUFACTURERS SPECIFICATIONS**

7120 HOT & COLD WATER SYSTEM

1. GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 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-AS7	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1	Energy Efficiency
AS 1432	Copper tubes for plumbing, gasfitting and drainage applications
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 systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1:2003	Plumbing and drainage - Water services
AS/NZS 3500.4: 2003	Plumbing and drainage - Heated water services
AS/NZS 3500.5	Plumbing and drainage - Housing installations
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS 3688	Water supply - Metallic fittings and end connectors
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: 2010	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	

Requirements

- 1.3 **QUALIFICATIONS**
Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

- 1.4 **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.

Warranties

- 1.5 **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.

Performance

- 1.6 **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.
- 1.7 **STANDARDS FOR COPPER PIPE**
This section is based on [NZS 3501](#) to [NZBC G12/AS1](#) for the supply of copper pipe and fittings.
If the specified pipe is not available, pipes to AS 1432 and fittings to AS 3688 can be used, under [NZBC G12/VM1](#) if written BCA approval is obtained by the plumber (both Standards are referenced in [AS/NZS 3500.1:2003](#)). If these Standards are used adjust diameters so that bore sizes are not compromised, otherwise comply with all other aspects of this section.
The whole project to be either to [NZS 3501](#) or AS 1432.

2. PRODUCTS

- 2.1 **COPPER PIPE**
To [NZS 3501](#) complete with copper-alloy compression fittings or crox type joints and seal ring compression joints complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), Table 1 and [NZBC G12/AS1](#), Table 1.
- 2.2 **PVC-U PIPE**
Complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#) Durability, Table 1 and [NZBC G12/AS1](#), Table 1.
- 2.3 **POLYBUTYLENE PIPE**
Polybutylene tubing to [AS/NZS 2642.1](#), [AS/NZS 2642.2](#) and [AS/NZS 2642.3](#) complete with fittings and accessories brand-matched with durability to [NZBC B2/AS1](#) Durability, table 1 and [NZBC G12/AS1](#), table 1.

- 2.4 **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.
- 2.5 **VALVES**
Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to [NZBC G12/AS1](#).
- 2.6 **TEMPERING VALVE**
Tempering valve to [NZS 4617](#) to [NZBC G12/AS1](#).
- Materials - Hot water heating appliances**
- 2.7 **ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE**
To [NZS 4305](#), ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.
- Components**
- 2.8 **PROTECTIVE TAPE**
Plasticised PVC tape system with primer, mastic fixing and outer coating.
- 3. EXECUTION**
- 3.1 **EXECUTION GENERALLY**
Generally carry out the whole of this work and tests to [NZBC G12/VM1](#) or [NZBC G12/AS1](#).
- 3.2 **HANDLE AND STORE**
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.
- 3.3 **CORE HOLES AND SLEEVES**
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.
- 3.4 **CONCEAL**
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.
- 3.5 **CORROSION**
Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.
- 3.6 **THERMAL MOVEMENT**
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.
- 3.7 **PIPE SIZE**
Flow rates to each outlet to be no less than those given in [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in [NZBC G12/AS1](#), table 4, Tempering valve and nominal pipe diameters.

- 3.8 ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 3.9 EXCAVATE
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

- 3.10 JOINTING COPPER PIPE
Braze pipe, fit alloy compression fittings, cross type joints and seal ring compression joints to [NZBC G12/AS1](#).
- 3.11 JOINTING PVC-U PIPE
Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to [NZBC G12/AS1](#).
- 3.12 JOINTING POLYBUTYLENE PIPE
Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.
- 3.13 JOINTING POLYETHYLENE PIPE (COLD WATER ONLY)
Seal ring compression joints and electrofusion to [NZBC G12/AS1](#).

Application - Pipework installation

- 3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION
From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.
- 3.15 HOT WATER PIPEWORK
Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and G12/VM1 or G12/AS1.
- 3.16 EQUIPOTENTIAL BONDING
Earth metallic water supply pipe and metallic sanitary fixtures to [NZBC G12/AS1](#), 9.0.
- 3.17 IN-LINE FILTER
Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

- 3.18 HOT WATER CYLINDER INSTALLATION GENERALLY
Install hot water cylinders complete to the manufacturer's requirements and to [NZBC G12/AS1](#), 6. 11, Water heater installation. Valve-vented systems to [NZS 4607](#).
- 3.19 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES
Non-gas (electric, wet-back, solar etc) water heating appliances to be restrained to manufacturer's requirements and [NZBC G12/AS1](#), 6.11, Water Heater Installation.

- 3.20 **INSTALLING HOT WATER PIPE INSULATION**
Insulate all hot water pipes to [NZBC H1/AS1](#), [AS/NZS 3500.5](#), 3.33 **Water and Energy Efficiency**, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.
- 3.21 **INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS**
Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with [NZBC G12/AS1](#): 6.11. Valve-vented systems to [NZS 4607](#).
- 3.22 **INSTALL HOT WATER CYLINDER OVERFLOW TRAY**
Install drained overflow tray to hot water cylinder to [NZBC G12/AS1](#).
- 3.23 **INSTALL TEMPERING VALVE**
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.
- 3.24 **PENETRATIONS**
Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Installation - Valves

- 3.25 **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.
- 3.26 **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

- 3.27 **LABEL**
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.
- 3.28 **CLEAN IN-LINE FILTER**
Clean all in-line filters on completion of works.
- 3.29 **REPLACE**
Replace damaged or marked elements.
- 3.30 **LEAVE**
Leave work to the standard required by following procedures.
- 3.31 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

Water main

- 4.1 **POLYETHYLENE WATER MAIN**
Size: 25mm outside diameter (i.e. DN 25 in [AS/NZS 4130](#))

Pipework

- 4.2 **COPPER PIPE**
Manufacturer: As supplied by Plumber

- 4.3 PVC-U PIPE
Manufacturer: As supplied by plumber
- 4.4 POLYBUTYLENE PIPE
Manufacturer: As supplied by plumber
- 4.5 POLYETHYLENE PIPE
Manufacturer: As supplied by plumber

Hot water systems

- 4.6 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
Brand/Size/Model As supplied by Builder

7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES

1. GENERAL

This section relates to the supply and installation of sanitary fixtures, tapware and sanitary accessories.

1.1 RELATED WORK

Refer to 7120 or 7123 HOT AND COLD WATER SYSTEM for hot water cylinders.

Refer to 7420 or 7421 SANITARY SYSTEMS for the supply and fitting of waste disposal pipework

Refer to the electrical section/s for electrical connection of accessories.

Documents

1.2 DOCUMENTS

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

NZBC E3/AS1	Internal moisture
NZBC F2/AS1	Hazardous building materials
NZBC G1/AS1	Personal hygiene
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water
NZBC G13/AS3	Plumbing and drainage
AS/NZS 1730	Washbasins
AS/NZS 2023	Baths for ablutionary purposes
AS/NZS 3500.1:2003	Plumbing and drainage - water services
AS/NZS 3500.2:2003	Plumbing and drainage - sanitary plumbing and drainage
AS/NZS 3662	Performance of showers for bathing
NZS 4223.3	Glazing in buildings - Human impact safety requirements
Plumbers, Gasfitters and Drainlayers Act 2006	

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

Requirements

1.3 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a Certifying Plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

1.4 SUPPLIER

A specialist in the supply of tapware, and employing experienced architectural representatives available to assist during the course of the installation.

2. PRODUCTS

2.1 SANITARY FIXTURES

Refer to SELECTIONS for product selection.

2.2 TAPWARE

Refer to SELECTIONS for product selection.

2.3 SANITARY APPLIANCES

Refer to SELECTIONS for product selection.

2.4 SANITARY ACCESSORIES

Refer to SELECTIONS for product selection.

- 2.5 ELECTRICAL SANITARY ACCESSORIES
Refer to SELECTIONS for product selection.

3. EXECUTION

Conditions - sanitary fixtures

- 3.1 DELIVERY
Only deliver to the site fixtures or fittings that can be immediately unloaded into suitable storage or be placed for direct installation.
- 3.2 STORAGE AND HANDLING
Take delivery of and store components complete with protective casings and coverings in areas that are enclosed, clean and dry and where no work is being done. Remove protection only to the extent that will allow installation.
- 3.3 QUALITY STANDARDS INCLUDING NZBC G13/AS1
Installation work to comply with [NZBC G1/AS1](#), [NZBC G12/VM1](#), [NZBC G12/AS1](#), [NZBC G13/AS1](#) and the fixture manufacturer's requirements.
- 3.4 SUBSTRATE
Ensure substrate and fixings will allow work of the specified standard.
- 3.5 CO-ORDINATION
Do not proceed if the points of supply and drainage services do not match the points of the fixtures without force or distortion.
- 3.6 INSTALLATION REQUIREMENTS INCLUDING NZBC G13/AS1
Install to [NZBC G1/AS1](#), [NZBC G12/VM1](#), [NZBC G12/AS1](#), [NZBC G13/AS1](#), [NZBC E3/AS1](#) and to the fixture manufacturer's installation requirements for each component. Carry out preparatory and assembly work, including connections to supply and drainage services and the application of slurries and sealants in sequence. Seal between all sanitary fixtures and wall linings, fixtures and the tops they are in, the tops and wall linings, to [NZBC E3/AS1](#), 3.2.2. Fixtures include baths, basins, tubs or sinks, Tops include, vanities, bath surrounds, sink benches, etc, and there upstands.
- 3.7 PROVIDE SUPPORT
Confirm fixing points needed for each unit and provide solid blocking at each fixing bracket location.

Conditions - tapware

- 3.8 RETAIN
Retain tapware in the manufacturer's original packaging and ensure that units are complete with fixings and installation instructions. Label each unit separately with its fitting name and space number.
- 3.9 STORE
Store tapware packages in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

Conditions - sanitary accessories

- 3.10 RETAIN
Retain fixtures, fittings and hardware in the manufacturer's original packaging and ensure that units are complete with associated fixings and installation instructions. Label each unit separately to match the submitted and approved schedule.

- 3.11 **PACKAGE**
Package fixtures, fittings and hardware units required in clear plastic and label each to match the drawings and the submitted schedule. Place packages in cartons selected for 'level', 'location', and/or 'sector' and label the packages and the cartons similarly.
- 3.12 **STORE**
Store items in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.
- 3.13 **INSPECTION**
Before starting the installation of proprietary items, check relevant spaces and wall and floor finishes for any condition that would not allow the proper installation of any unit. Do not proceed until such conditions have been remedied.
- 3.14 **INSTALLING TOILET PAN**
Carry out preparatory and assembly work, including connections to supply and drainage services and the application of slurries/bedding and sealants in sequence. Fit the toilet pan in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant. Fit seat.
- 3.15 **INSTALLING CISTERNS**
Fit firmly in place and connect the specified cisterns from the supply services through the flush pipes to the relative fixtures in the positions as detailed all plumb and level.
- Installation - Basins**
- 3.16 **INSTALLING VANITIES - INTEGRAL BASINS**
Install in accordance with the manufacturer's requirements. Connect to supply and drains through trap to the drainage system. Seal top and upstand to wall surface to comply with [NZBC E3/AS1](#).
- Installation - Showers**
- 3.17 **INSTALLING SHOWER FITTINGS**
Shower waste, mixer and rose to be install to [NZBC G1/AS1](#) and to [AS/NZS 3662](#).
- Installation - Baths**
- 3.18 **INSTALLING BATHS**
Install to [NZBC G1/AS1](#). Set firmly in cradle with required points fully supported, level and flush. Connect to supply and drainage services.
- Installation - Sinks**
- 3.19 **INSTALLING CLEANERS SINKS AND TUB UNITS**
Install in accordance with manufacturer's requirements. Connect to supply and drainage services.
- Installation - Miscellaneous**
- 3.20 **INSTALLING STAINLESS STEEL FIXTURES**
Carry out preparatory work and fit elements in position plumb, level, flush and rigid without stressing the attachment points in sequence. Connect to supply and drainage services.
- Application - tapware**
- 3.21 **GENERAL**
To [AS/NZS 3500.1](#) dated 2003 and in accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with [NZBC G12/AS1](#).
- Application - sanitary accessories**

3.22 INSTALLING ACCESSORIES

Fit specified fittings firmly in place at required dimensions relative to floor and adjoining sanitaryware fittings, all plumb and level.

3.23 LOCATE

Locate units at heights and/or locations shown on the drawings, or as required to comply with [NZBC G1/AS1](#). For any dimension not shown or known, request direction before proceeding.

3.24 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

3.25 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

Completion

3.26 REPLACE

Replace damaged or marked elements.

3.27 PROTECTIVE COVERINGS

Leave fixtures, fittings and accessories clean and unblemished with stickers and protective coverings removed, with supply and drainage connections and all parts fully operating and working. Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following work.

3.28 REMOVE

Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 TOILET

Location: Refer Plans
Toilet pan: As supplied by builder

4.2 VANITY UNIT

Location: Refer Plans
Vanity: As supplied by builder

4.3 SHOWER CUBICLE

Location: Refer Plans
Manufacturer: As supplied by builder
Shower Mixer and spout: As supplied by builder

4.4 BATH

Location: Refer Plans
Bath model: As supplied by builder
Bath mixer/spout: As supplied by builder

4.5 LAUNDRY TUB

Location: Refer plans
Tub model: As supplied by builder

4.6 ELECTRICAL ACCESSORIES

Location: Refer Plans
Heated towel rail: As supplied by builder

7212 GAS SYSTEM LPG CYLINDERS

1. GENERAL

This section relates to Installation and maintenance of a 45kg LPG twin cylinder system and associated piping systems.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

WorkSafe:	WorkSafe New Zealand.
HSNO:	Hazardous Substances and New Organisms Act 1996.
LPGA	LPG Association of New Zealand Inc.

The following definitions apply specifically to this section:

Condensate:	The liquid that separates from the gas downstream of any regulator due to the reduction in temperature resulting from pressure reduction.
Condensate trap:	(also known as a drip leg or tailpipe) a device installed in a gas line to trap the condensate liquid
Enclosure:	A compartment, an enclosed area or a partitioned-off space primarily used for the installing of a gas cylinder meter, or gas pressure regulator.
LAB number:	Number allocated by WorkSafe when a cylinder is approved.
POL fitting:	(Prest-O-Lite) The common name given for a standard union with left hand thread, used for connection to a 45 Kg cylinder.
Pigtail:	A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.
Twin cylinder installation:	A cylinder installation where two cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

1.2 DOCUMENTS

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

NZBC G10/AS1	Piped services
NZBC G11/AS1	Gas as an energy source
AS/NZS 1596	The storage and handling of LPG.
AS/NZS 4129	Fittings for polyethylene pipes for pressure applications
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
AS 4176	Polyethylene/aluminium and cross linked polyethylene/aluminium macrocomposite pipe systems for pressure applications
AS/NZS 5601.1: 2010	Gas Installations - general installations
LPGA CoP No.2	Installation and maintenance of twin 45kg cylinder systems

Electricity (Safety) Regulations 2010
Gas (Safety and Measurement) Regulations 2010
[Plumbers, Gasfitters and Drainlayers Act 2006](#)

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For the complete gas system

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

Requirements

- 1.4 COMPLY
Comply with the Gas (Safety and Measurement) Regulations 2010 and Electricity (Safety) Regulations 2010.
- 1.5 QUALIFICATIONS
Work to be carried out by gasfitters experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).
- 1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS
Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.
- 1.7 DESIGN
Design the piping system to [AS/NZS 5601.1](#), with pipe sizes to give a minimum pressure at any appliance inlet, to [AS/NZS 5601.1](#), Table 5.1, of 2.75 kPa for LPG. Include pressure regulators if required.
- 1.8 LOCATION OF CYLINDERS
Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#). Ensure location allows good accessibility for cylinder replacement to [AS/NZS 5601.1](#). Coordinate with electrical installations to ensure clearances are maintained.

Compliance information

- 1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE
Provide the following compliance documentation: -
- Manufacturer's, importers or distributors warranty
- Installer / applicator's warranty
- Gasfitting Certificate of Compliance - from the installer
- 1.10 GAS CERTIFICATE OF COMPLIANCE
Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.
- 1.11 GAS SAFETY CERTIFICATION
Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.
- 1.12 GAS APPLIANCE COMPLIANCE
Supplier to provide Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2. PRODUCTS

Materials

- 2.1 PIPEWORK GENERAL
Pipework requirements to [AS/NZS 5601.1](#), particularly [AS/NZS 5601.1](#), Section 4,
Materials fittings and components.
- 2.2 COPPER PIPE
Complete with fittings to [AS/NZS 5601.1](#). Range of use to [AS/NZS 5601.1](#), table 4.1
Consumer Piping Materials.

2.3 **MACROCOMPOSITE PIPE**
Polyethylene/aluminium/cross linked polyethylene combination (PE/AL/PE, PE-X/AL/PE-X or PE-X/AL/PE) macrocomposite pipe systems for pressure applications to AS 4176. Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. Used for general pipework, can also be used in ground beneath a building.

2.4 **POLYETHYLENE PIPE**
Polyethylene pipes to [AS/NZS 4130](#) Series two, or [AS/NZS 4130](#) Series three. Fittings to [AS/NZS 4129](#). Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. For use in ground but not beneath a building.

2.5 **ISOLATING VALVES**
Manual shut-off valves to [AS/NZS 5601.1](#).

2.6 **CYLINDERS**
Full 45kg cylinders to be supplied by the LPG supply company.

Components

2.7 **CHANGEOVER VALVES**
To the requirements of [AS/NZS 5601.1](#).
Automatic changeover valves including a non-return valve on each pigtail connection. The valve must comply with the requirements of [HSNO](#) and WorkSafe.

Changeover valves may be comprised of a first and second stage regulator system in a single body, or as a combination of separate component items.

Changeover valves complete with all components necessary for the operation of the bottle gas system including: -

- Flexible Pigtails
- Regulators
- Condensate trap
- Over pressure shut off
- All required valves

Protect from weather.

Accessories

2.8 **ANCHORS AND CHAINS**
To the requirements of [LPGA COP No.2](#).
All cylinders larger than 25 litres capacity shall be securely held in place by galvanized chains and brackets. The brackets shall be fastened to a wall or similar robust anchorage. The cylinder's fastenings must be capable of withstanding a steady applied load equal to four times the weight of the filled cylinder.

3. EXECUTION

Conditions

3.1 **GENERALLY**
Carry out the whole of this work to the requirements of [NZBC G10/AS1](#), [NZBC G11/AS1](#) and [AS/NZS 5601.1](#).

3.2 **BURIED PIPES**
Pipes to be bedded in a trench, backfilled, marker taped and separated from other services, to [AS/NZS 5601.1](#), 5.4 Installation of consumer piping underground.

Application

3.3 **INSTALL PIPING**
Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to [AS/NZS 5601.1](#).

Confirm the type of pipe and its location. Label pipework to distinguish it from other services to [AS/NZS 5601.1](#), 5.1.12 **Identification of pipework.**

3.4 PRESSURE TEST

Pressure test the system for leakage to [AS/NZS 5601.1](#) before pipework is concealed by linings.

3.5 LOCATION OF CYLINDERS

Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

Installation of cylinders

3.6 GENERAL

Cylinders shall be installed upright with the valve uppermost to ensure the inlet to the safety valve remains in the vapour space clear of the liquid content of the cylinder.

- Clearances around cylinders shall comply with CLEARANCES AROUND CYLINDER clause.
- Where two or more exchange cylinders are installed, a manual or automatic changeover valve shall be fitted immediately upstream of the regulator. This valve may be an integral part of an automatic changeover regulator.

3.7 SUPPORT

Cylinders shall not be supported by other cylinders.

Cylinders shall be installed on supporting bases that are firm, level, of non-combustible material, and with a finished surface that prevents ponding of water and at least 50mm above the surrounding surface. Soil is not considered an acceptable supporting base.

All cylinders to be securely held in place by galvanized chains and anchor brackets. The brackets shall be fastened to a wall or similar robust anchorage. Fixings shall be galvanised or stainless steel.

3.8 CYLINDER CONNECTION

Cylinders should be connected directly to the changeover valve assembly by flexible pigtails.

An excess flow valve, to prevent cylinder venting if hose fails, shall be fitted immediately upstream of the piping or hose assembly. This excess flow valve may be an integral part of the POL fitting.

Pigtails connecting cylinders to changeover valves or manifolds should not exceed 1 metre in length.

A non-return valve must be fitted in the supply between each cylinder and the changeover valve, or in a manifold system, between each cylinder and its manifold connection, to prevent flow across the changeover system to [AS/NZS 5601.1](#).

3.9 CYLINDERS IN AN ENCLOSURE OR RECESS

To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

3.10 CYLINDERS UNDER BUILDINGS SUPPORTED ON PIERS

To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

3.11 CLEARANCES AROUND CYLINDER

Cylinders should be installed with clearances complying with the [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**, figure J3 **Minimum clearance to ignition sources**, and figure J4 **Minimum clearance to a drain or opening into a building**, and at least 1 metre from any readily ignitable material. Readily ignitable materials include paper, dry grass or oily substances.

- 3.12 CYLINDER SAFETY VALVE DISCHARGE
The discharge point of the cylinder safety valve shall be directed away from any other cylinder, piping, building, drain, approach path to cylinders and any opening into or under a building.

- 3.13 TEST POINTS
A pressure test point should be installed immediately downstream of each second stage regulator. Such test point may be an integral part of the regulator.

Completion

- 3.14 ROUTINE CLEANING
Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.

- 3.15 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.

Commissioning

- 3.16 FINAL INSPECTION AND TESTING
Check cylinders are working and ensure all connected appliances are operating correctly. Carry out final inspections and testing, pressure test the system for leakage to [AS/NZS 5601.1](#). Leave system shut off at the cylinders until practical completion.

- 3.17 HANDOVER
Provide a copy of the system operating and maintenance instructions.

Completion

- 3.18 REPLACE
Replace damaged, cracked or marked elements.

- 3.19 LEAVE
Leave appliances clean and in full working order to the standard required by following procedures.

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

4. SELECTIONS

Materials

- 4.1 LPG CYLINDER SYSTEM
- | | |
|--------------------------|-----------------------|
| Location: | Refer Drawings |
| LPG supplier: | As selected by client |
| Cylinder Number/size: | 2 x 45kg |
| Changeover valve supply: | LPG supplier |
| Cylinder restraint: | Anchors and chain |

7411 RAINWATER SPOUTING SYSTEMS

1. GENERAL

This section relates to rainwater disposal systems including spouting and downpipes:

- metal
- PVC

Related work

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E1/AS1	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
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.

1.2 ABBREVIATIONS AND TERMS

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

BMT	Base metal thickness
MRM	New Zealand Metal Roofing Manufacturers Inc
Spouting	Roof gutter bracketed off the roof edge or fascia.
Gutter	Internal gutter or gutter formed as integral part of the roof fabric.

Requirements

1.3 QUALIFICATIONS

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

Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

Warrant this work under normal environmental and use conditions against:

3 years:	For weatherproofing by substandard workmanship:
From:	Commence the warranty from the date of completion of installation
Form:	Installers standard warranty form

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions:

10 Years	For failure of coating adhesion
10 Years	For weatherproofing by material penetration

Form:	Manufacturer's standard warranty form
From:	Commence the warranty from the date of completion of installation

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

Performance

- 1.6 TEST
Test the completed rainwater disposal system with water to ensure spoutings are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in spoutings.

2. PRODUCTS

Materials - metal

- 2.1 SPOUTING
Complete with matching brackets to suit spouting and screws. Refer to SELECTIONS for type.
- 2.2 SPOUTING BRACKETS
All exposed brackets to be colour matched before installation. Brackets to be hot-dipped galvanised, zincalume, aluminium, stainless steel or brass as specified and to suit application. Electroplated components are not acceptable. Refer to SELECTIONS for type.
- 2.3 DOWNPIPES
Complete with stand-off brackets, screw fixed. Refer to SELECTIONS for type.

Materials - fascia/barge system

- 2.4 EXTERNAL FASCIA/BARGE SPOUTING SYSTEM
Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer's requirements. Refer to SELECTIONS for type.

Components

- 2.5 DROPPERS
Metal or uPVC droppers, compatible with spouting material and sized to fit inside the downpipe.
- 2.6 FASTENERS GENERALLY
Minimum Class 4 durability and not less than the roofing material being fixed.
- 2.7 RIVETS
Sealed aluminium, minimum diameter 4mm.
- 2.8 SEALANT
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, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.
- 3.3 THERMAL MOVEMENT
Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 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. Do not allow copper downpipes to discharge onto lower galvanized or zinc aluminium coated steel roofs.

Application - metal

3.5 INSTALLATION GENERALLY

Install to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations where not otherwise specified.

3.6 INSTALL VALLEY GUTTERS

Attach valley gutters to valley boards by clips allowing for thermal movement to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, clause 8.4.5 Valley gutters. Separate valley gutter from valley boards with a layer of bituminous roof underlay.

3.7 INSTALL SECRET GUTTERS

Install secret gutters to fall allowing for thermal movement to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, clause 8.4.8 Secret gutters. Rivet and seal joints with MS Polymer sealant.

3.8 INSTALL METAL 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 750mm centres maximum for external gutters less than 175mm wide and at 600mm centres maximum for gutters 175mm to 300mm wide. In areas where snow fall is possible the centres should be reduced to 600mm maximum. Lap spouting joints a minimum of 40mm, silicone seal between surfaces and pop rivet to the manufacturer's recommendations. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations.

3.9 INSTALL PRE-PAINTED METAL 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 750mm centres maximum for external gutters less than 175mm wide and at 600mm centres maximum for gutters 175mm to 300mm wide. In areas where snow fall is possible the centres should be reduced to 600mm maximum. Lap spouting joints a minimum of 40mm and silicone seal and pop rivet to the manufacturer's recommendations. Cut out neatly for and fit the pre-formed downpipe dropper and silicone seal around the lap joint. All installation to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations.

3.10 INSTALL EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Install concealed fascia brackets to rafters with either screws or nails and fit fascia to a level line. Fit gutter brackets to fall to outlet. Cut and form corner junctions and barge junctions and fit spouting rigidly to brackets. Cut out neatly for and fit pre-formed downpipe droppers. Silicone seal and pop-rivet all lap joints. All installation to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations.

3.11 INSTALL DROPPERS

Install either 2 outlets or one outlet and an overflow to each spouting section. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations.

3.12 INSTALL METAL DOWNPIPES

Form downpipes complete with angle bends as needed with joints lapped and sealed. Screw fix with pipe clips to rigidly stand off the wall plumb and discharging into stormwater gully or inlet pipe. All installation to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations.

- 3.13 **INSTALL DOWNPIPE SPREADERS**
Install downpipe spreaders where required to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, clause 8.5.1 Downpipe spreaders. Provide spreaders to downpipes that discharge on to a lower roof. Ensure spreaders do not discharge directly over fasteners or laps. Spreaders to have holes equalling twice the diameter of the downpipe.

- 3.14 **INSTALL OUTLETS AND OVERFLOWS**
Install outlets and overflows where required to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, clause 8.6.2 Outlets and overflows.

Completion

- 3.15 **REPLACE**
Replace damaged or marked elements.
- 3.16 **LEAVE**
Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.
- 3.17 **REMOVE**
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 **SPOUTING**
Brand: Continuous
Profile/size: Classic
Cross section: 5200mm²
Material: Colorsteel
Thickness: 0.55mm
Colour: As Selected by Client
- 4.2 **SPOUTING BRACKETS**
Type: Brand Matched
- 4.3 **DOWNPIPES**
Brand: Marley
Profile/size: 80mm
Material: PVC
- 4.4 **DOWNPIPE BRACKETS**
Type: Brand matched
Material: PVC

Fascia/barge spouting system

- 4.5 **EXTERNAL FASCIA/BARGE SPOUTING SYSTEM**
Brand: Continuous
Profile/size: 185mm
Material: Colorsteel
Thickness: 0.55mm
Colour: As selected by client

Miscellaneous items

- 4.6 **DOWNPIPE SPREADERS**
PVC to suit as per E2/AS1

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 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 1260](#) PVC-U pipes and fittings for drain, waste and vent applications
- [AS/NZS 2032](#) Installation of PVC pipe systems
- [AS/NZS 3500.2:2003](#) Plumbing and drainage - Sanitary plumbing and drainage
- [Plumbers, Gasfitters and Drainlayers Act 2006](#)

1.2 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 and complete all tests to [NZBC G1/AS1](#): 2.0, 3.0 and [NZBC G13/AS1](#).

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

Test soil and waste disposal systems to ensure no leakage exists and leave in proper working order.

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: Marley
- 4.2 EXPOSED PIPES AND TRAPS
Brand/type: Marley

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 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 3500.2:2003	Plumbing and drainage - Sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
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
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 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

- 2.6 INSPECTION COVERS
Cast iron frame with screw-down cover.
- 2.7 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 drainage work and tests to [NZBC G13/AS2](#) (foul water), [NZBC E1/AS1](#) (stormwater). Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#), NZS 2566.1 and [AS/NZS 2566.2](#). Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#) and 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 INSTALL GULLY TRAPS
Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.
- 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.
- 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 FIELD TEST
Field test drains for watertightness (PVC-U to [AS/NZS 2032](#) or AS/NZS 2566. 2 Appendix N) to the satisfaction of the territorial authority inspector.
- 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

Brand/type: As supplied by Plumber / Drainlayer

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
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3	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 3350.1](#) Safety of household and similar electrical appliances - General requirements

[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 60598.2.2:2001](#) Luminaires - Particular requirements - Recessed luminaires

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

Warranties

- 1.3 **WARRANTY**
Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.
1 year: Warranty period

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

Requirements

- 1.4 **COMPLY**
Comply with the Electricity (Safety) Regulations 2010, [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and [TCF](#) Premises Wiring 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.
- 1.5 **QUALIFICATIONS**
Carry out work under the supervision of an electrical licensed supervisor.
- 1.6 **SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER**
Before installation work commences obtain from the electrical engineer a declaration of conformity. The declaration of conformity is to comply with the Electrical (Safety) Regulations (2010), regulations 57 and 58.
- 1.7 **SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN**
Before installation work commences provide a declaration of conformity. The declaration of conformity is to comply with the Electrical (Safety) Regulations (2010), regulations 57 and 58. It must be signed by the designer of the installation.
- 1.8 **ELECTRICAL CERTIFICATE OF COMPLIANCE**
Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.
- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.
- 1.9 **ELECTRICAL SAFETY CERTIFICATE**
Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

2. PRODUCTS

- 2.1 MAINS SUPPLY, SINGLE PHASE
Tough plastic sheathed neutral screened cable to AS/NZS 4961 and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.
- 2.2 CABLES
Tough plastic sheathed copper conductors to [AS/NZS 5000.2](#), stranded above 1.0mm², and to [AS/NZS 3008.1.2](#). Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.
Lighting circuits: Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits: Commercial: 1.5mm² on 16 amp MCBs
Power circuits: 2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits: Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits: Single phase: 6mm² on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C.
- 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](#) 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 **CEILING ROSES**
White plastic mounting base with screwed cover, manufactured to [AS/NZS 3113](#).
Terminal type. Cylindrical section TPS for suspended fittings.
- 2.12 **BATTEN HOLDERS**
Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.
- 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.
- 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 3350.1](#).
- 2.16 **HEATED TOWEL RAILS**
Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 3350.1](#), scratch resistant powdercoated or chrome finish.
- 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 **DOMESTIC INSTALLATIONS**
Install 30mA RCD protection at the distribution board for all final sub circuits to control socket outlets and lighting except for fixed or stationary cooking equipment, to [AS/NZS 3000](#).
- 3.9 **HIGH RISK AREA INSTALLATIONS**
Install 30mA RCDs at the distribution board for areas not covered in Domestic installations, or using fixed wired RCD protected socket outlets in areas that may represent increased risk of electric shock to the user:
- 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 **LIGHT FITTINGS**
Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.
- 3.14 **EXTRA LOW VOLTAGE LIGHTING**
Use electronic transformers for ELV lamps, one transformer per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers and rear of light fittings are adequately ventilated and clear of any thermal insulation, to [AS/NZS 3000](#).
- 3.15 **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.

- 3.16 **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.
- 3.17 **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.
- 3.18 **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.
- 3.19 **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](#) and the [NZBC G9/AS1](#)
 - 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](#).
- 3.20 **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.

Completion

- 3.21 **COMPLETION**
Leave installation operating correctly, with equipment clean and operational.

4. SELECTIONS

Materials

- 4.1 **SELECTIONS - FITTINGS AND HARDWARE**
Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.
- 4.2 **METER BOX**
 Location: Refer Drawings
 Brand / type: As supplied by Electrician
- 4.3 **DISTRIBUTION BOARD**
 Location: Refer Drawings
 Brand / type: DBF Flush as supplied by Electrician

Outlets - fittings

- 4.4 **INTERIOR OUTLETS**

Item	Brand / type
Switch / socket outlets:	as selected by client
Item	Brand / type
Shaver and earth leakage protection socket outlets:	RCD type to match selected series single vertical double horizontal plate safety switch shaver / RCD plate safety switch IP56
- 4.5 **INTERNAL LIGHT FITTINGS**
Brand / type
 as selected by client

- 4.6 SMOKE ALARMS
Location: refer drawings
Brand / type: as selected by client
- 4.7 HEATED TOWEL RAILS
Location **Brand / type**
Bathroom and Ensuite as selected by client
- 4.8 BATHROOM FANS AND HEATERS
Location **Brand / type**
Bathroom / ensuite-Extract: Manrose SF150