These documents must be retained on site. Inspections may not be carried out if they are not.

BC191026

Prime Designs Wellington Ltd

PRIME DESIGNS
CREATIVE | FUNCTIONAL | ARCHITECTURE

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

TEKAPO 2 - Kelson Heights Subdivision

Project Specification

Proposed Lot 14, Kelson Heights Stage 1, Kelson, Lower Hutt, New Zealand
Project Ref: D6-G

Printed: 23 September 2019

masterspec

Specification built using Masterspec software
Project ID: 177893 - 147011

BUILDING CONSENT

GRANTED
4/12/2020

HUTT CITY COUNCIL

HUTT CITY
TE AWA KAIRANGI

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BC191026

1210 PROJECT.

1 GENERAL

1.1 PROJECT

Street address:	(D6-G) TEKAPO 2 - Stage 1, Kelson Heights
Legal description:	Lots 14, Stage 1 Kelson Heights
Project type:	New building
Intended use:	Single residential Dwelling
Intended life:	Indefinite but not less than 50 years

1.2 PROJECT DESCRIPTION

New timber framed 4 bedroom house with attached double garage. Linea weatherboards and horizontal Stria wall cladding over cavity with pressed metal tile cladding on purlins. RibRaft slab foundation, trusses by truss manufacturer.

1.3 LBP REQUIREMENT

Any site license LBP's shall have a minimum:
Site license in area of practice 1

Carpentry
Foundations 1: Concrete foundation and concrete slab-on-ground
Roofing 2: Pressed metal roof cladding
Wall cladding: James Hardie Stria and Linea

1.4 DESIGNER

Name:	Prime Designs
Mailing address:	PO Box 40432, Upper Hutt
Telephone:	04 528 8405
Email:	admin@primedesigns.co.nz

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1212 COMPLIANCE

1 GENERAL

1.1 SITE DATA

Exposure zone:	Zone C (to NZS 3604, 4.2 **Exposure zones** or E2/AS1 Zone E severe marine)
Wind zone:	H (to NZS 3604, table 5.4 **Determination of Wind Zone**)
Earthquake zone:	Zone 3 (to NZS 3604, figure 5.4 **Earthquake zones**)

1.2 PRODUCER STATEMENTS

Provide Producer Statements for the following
- Truss design
- Aluminium joinery
- Glazing

Provide Producer Statements in the required form. Where no form is specified provide in the industry/trade standard form. Provide all Producer Statements before the Building Consent Authority carries out the final inspection.

1.3 RECORDS OF WORK

Provide Records of Work for Restricted Building Work:
- Carpentry
- Roofing
- Foundations

Refer to the Building Consent for specific requirements. Provide Records of Work in the required form. Provide all Records of Work before the Building Consent Authority carries out the final inspection.

1213 SELECTIONS

1 GENERAL

The following selections are to be read in conjunction with the related work sections, where they are available, and the general sections.

2 SITE

2.1 NO SITE RELATED SELECTIONS

There are no site selections for this project.

3 STRUCTURE

<< 3110 CONCRETE WORK >>

3.1 DAMP-PROOF MEMBRANE - UNDER SLAB

Type/thickness:	Thermakraft Black 250 micron

3.2 CONCRETE REINFORCEMENT

Type:	Refer to Firth RibRaft installation manual

3.3 CONCRETE

Location:	Refer to architect's plans
Strength:	25 MPa

<< 3800 TIMBER FRAMING >>

3.4 FLOOR TIMBER FRAMING

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2

3.5 EXTERIOR WALL TIMBER FRAMING

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2
Cavity battens:	Radiata pine, Treated H3.1 (non-structural)
Jamb battens:	Radiata pine, Treated H3.1

3.6 ROOF TIMBER FRAMING

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2

3.7 ROOF TRUSSES

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2

3.8 INTERIOR WALL TIMBER FRAMING

Type/treatment:	Radiata pine, Grade SG8, Treated H1.2

4 ENCLOSURE

<< 4160 DAMP-PROOFING, UNDERLAYS AND RIGID AIR BARRIERS >>

There is no work section specification relating to the following selections

4.1 DAMP-PROOF COURSE

Brand/Type:	Thermakraft Supercourse 500

4.2 WALL UNDERLAY/ROOF UNDERLAY

Brand/Type:	Thermakraft Watergate Plus wall underlay Thermakraft 215 roof underlay

4.3 WINDOW FLASHING TAPE

Brand/Type:	Thermakraft Aluband

<< 4220 WALL CLADDING >>

4.4 CLADDING

Brand/Type:	James Hardie Linea weatherboards
Fixings:	Refer manufacturer's info
Jointers:	Refer manufacturer's info
Finish:	Owner to confirm

4.5 CLADDING

Brand/Type:	James Hardie Stria Cladding
Fixings:	Refer manufacturer's info
Jointers:	Refer manufacturer's info
Finish:	Owner to confirm

<< 4239 SOFFIT LINING >>

4.6 SOFFIT

Brand/Type/thickness:	James Hardie / HardieFlex 4.5mm
Fixings:	Refer manufacturer's info
Jointers:	Refer manufacturer's info
Finish:	Owner to confirm

<< 4310 ROOFING >>

4.7 ROOFING

Brand/Type:	Pressed Metal Tiles
Flashings:	Owner to select
Colour:	Owner to select

<< 4520 ALUMINIUM WINDOWS AND DOORS >>

4.8 ALUMINIUM WINDOWS AND DOORS

Brand/Type:	Owner to select
Finish/colour:	Owner to select
Jamb liners:	Owner to select
Flashings:	Owner to select
Hardware:	Owner to select

<< 4555 GARAGE DOORS >>

There is no work section specification relating to the following selections

4.9 GARAGE DOOR

Brand/Type:	Owner to select
Face panel:	Owner to select
Finish:	Owner to select

4.10 GARAGE DOOR CONTROLLER

Brand/Type:	Owner to select
Remotes quantity:	Owner to select

<< 4610 GLAZING >>

4.11 GLAZING - SAFETY

Location:	Refer architect's plans
Type:	Owner to select

4.12 GLAZING - DOUBLE

Location:	Refer architect's plans
Type:	Owner to select

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4.13 GLAZING - SHOWER SCREENS

Brand/Type:	Owner to select
Hardware:	Owner to select

4.14 GLAZING - MIRRORS

Location:	Owner to confirm
Type:	Owner to select

<< 4710 THERMAL INSULATION >>

4.15 WALL INSULATION

Brand/Type:	Earthwool
R value/Thickness:	R 2.2 / 90mm

4.16 CEILING/ROOF INSULATION

Brand/Type:	Earthwool
R value/Thickness:	R 3.2 / 170mm

<< 4820 FLASHINGS >>

There is no work section specification relating to the following selections

4.17 FLASHINGS - GENERALLY

Type:	Owner to select

4.18 FLASHINGS - CONCEALED

Type:	Owner to select

5 INTERIOR

<< 5110 INTERIOR LININGS AND TRIM >>

5.1 WALL LININGS

Location:	Refer architect's plans
Brand/Type/thickness:	GIB / standard, Aqualine to wet areas / 10mm
Finish:	Level 4

5.2 CEILING LININGS

Location:	Refer architect's plans
Brand/Type/thickness:	GIB / standard, Aqualine to wet areas / 13mm
Finish:	Level 4

5.3 INTERIOR TRIM

Skirtings:	Owner to select
Architraves:	Owner to select
Scotia:	Owner to select

<< 5230 INTERIOR DOORS & FRAMES >>

5.4 INTERIOR DOORS

Location:	Refer architect's plans
Leaf type/finish:	Owner to select
Frame type/finish	Owner to select
Hardware:	Owner to select

<< 5410 FLOORS >>

5.5 FLOOR

Location:	Refer architect's plans
Brand/Type/thickness:	Plywood, H3.1 to wet areas 20mm
Fixing method:	Nail

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<< 5510 JOINERY FIXTURES AND FITTINGS >>

5.6 FABRICATED JOINERY ITEMS

Location/item:	Owner to select
Carcass/finish:	Owner to select
Bench top:	Owner to select

5.7 PROPRIETARY JOINERY ITEMS

Location/item:	Owner to select
Assemble/install:	Owner to select

5.8 FABRICATED TIMBER STAIRS

Stair:	Owner to select
Balustrade/handrail:	Owner to select
Finish:	Owner to select

<< 5520 HARDWARE >>

There is no work section specification relating to the following selections

5.9 HARDWARE BRAND TYPE

Owner to select

6 FINISH

<< 6300 FLOOR COVERING >>

6.1 RESILIENT FLOORING (VINYL, LINOLEUM OR RUBBER)

Location:	Refer architect's plans
Brand/Type:	Owner to select
Jointing method:	Owner to select
Skirting or coving:	Owner to select
Trim or edging:	Owner to select

6.2 CARPET

Location:	Refer architect's plans
Brand/Type:	Owner to select
Underlay:	Owner to select
Trim:	Owner to select
Laying method:	Edge gripper

<< 6700 PAINTING >>

6.3 EXTERIOR PAINTING

Roof:	Owner to select
Walls	Owner to select

6.4 INTERIOR PAINTING

Walls	Owner to select
Ceiling:	Owner to select
Doors	Owner to select
Cabinetry:	Owner to select
Trim:	Owner to select

7 SERVICES

<< 7120 WATER SYSTEM >>

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7.1 WATER SYSTEM

Water heater type:	Electric Hot water cylinder
Water heater brand/model:	Owner to select

<< 7150 SANITARYWARE, TAPWARE & ACCESSORIES >>

7.2 SANITARYWARE

Location:	Item/brand/reference:
Refer architect's plans	Owner to select

7.3 TAPWARE

Location:	Item/brand/reference:
Refer architect's plans	Owner to select

7.4 SANITARY ACCESSORIES

Location:	Item/brand/reference:
Owner to select	Owner to select

<< 7410 RAINWATER SPOUTING SYSTEM >>

7.5 SPOUTING

Brand/type/size: Colorsteel

7.6 DOWNPIPES

Brand/type/size: Colorsteel 80mm dia.

<< 7420 SANITARY WASTE SYSTEM >>

7.7 FINISHES - EXPOSED SANITARY WASTE ITEMS

Floor waste grates: Owner to select

<< 7550 HEATING >>

There is no work section specification relating to the following selections

7.8 SPACE HEATING

Brand/type/reference: Owner to select

<< 7700 ELECTRICAL >>

7.9 ELECTRICAL OUTLETS AND SWITCHES

Brand/type/reference: Owner to select

7.10 LIGHT FITTINGS

Brand/type/reference: Owner to select

7.11 SMOKE ALARMS

Brand/type/reference: Owner to select

7.12 ELECTRICAL APPLIANCES AND EQUIPMENT

Brand/type/reference: Owner to select

8 EXTERNAL

<< 8000 LANDSCAPE >>

There is no work section specification relating to the following selections

8.1 DRIVEWAY

Type/finish: Owner to select

8.2 PATHS

Type/finish: Owner to select

8.3 FENCES & GATES

Type/finish: Owner to select

1220 GENERAL REQUIREMENTS

1 GENERAL

1.1 THE WORKS

The works are as described in this specification and shown on the drawings.

1.2 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.
Contractor: The person contracted by the owner to carry out the contract.

1.3 THE SITE

The site of the works, the site address and the legal description are listed under the sections 1210 PROJECT. Confine access and work to the area of site indicated on the drawings.

1.4 SPECIFICATION SECTIONS

Sections are for reference and convenience only and do not constitute individual trade sections or work elements. Read all sections together and read this section with all other sections.

1.5 INTERPRETATIONS

Required:	Required by the documents, or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Approval:	Approval in writing.
Direction:	Direction in writing.
Notified:	Notified in writing.

1.6 ABBREVIATIONS

The following abbreviations are commonly used throughout the specification:

AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
LBP	Licensed Building Practitioner
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NUO	Network Utility Operator
OSH	Occupational Safety and Health
RBW	Restricted Building Work
TA	Territorial Authority

1.7 INCONSISTENCIES

If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.

1.8 SUBSTITUTIONS

A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions.
Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified. Advise the owner whether an amendment will or may be required to the Building Consent and the expected costs of such amendment.

1.9 THE WORDS "PROVIDE" OR "FIX"

The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.

1.10 MANUFACTURERS AND SUPPLIERS

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

1.11 REFERENCED DOCUMENTS

Reference is made to various New Zealand Building Code (NZBC) acceptable solutions (AS) and verification methods (VM) for criteria and/or methods used to establish compliance with the Building Act 2004. Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS) 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. Documents cited both directly and within other cited publications are part of this specification.

1.12 PRECEDENCE OF REFERENCED DOCUMENTS

This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where Building Consent is affected, the change notified to the BCA for advice as to whether an amendment is required to the Building Consent Authority.

1.13 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004 to carry out any work not in accordance with the Building Consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where Building Consent is affected refer any change to the BCA for advice as to whether an amendment is required to the Building Consent.

1.14 STATUTORY OBLIGATIONS

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

1.15 BUILDING CONSENT

Obtain the original or copies of the Building Consent form and documents from the owner and keep on site. Liaise with the BCA and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.16 INSPECTIONS

Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the BCA inspector.

1.17 KEY PERSONNEL

Provide names and contact detail of LBP's/ key personnel. Prior to Restricted Building Work being carried out, provide names, registrations numbers (where appropriate) and contact detail of LBP's that are required for RBW by the Building Consent Authority as part of the Building Consent.

Include the following as applicable:

- Person with the appropriate site license
- Carpenter
- Registered drainlayer
- Registered plumber
- Registered gasfitter
- Registered electrician
- Roofer
- Block layer
- Bricklayer
- External plasterer
- External window manufacturer
- Waterproof membrane applicator

1.18 PRODUCER STATEMENTS AND LBP DOCUMENTATION

When Records of Work or producer statements verifying construction are required, for the application for the Code Compliance Certificate, provide copies to both the BCA and the owner. Provide LBP documents and producer statements in the form required by the BCA.

1.19 CERTIFICATE OF COMPLIANCE

Provide Certificates of Compliance for electrical and gas work carried out.

1.20 CODE COMPLIANCE CERTIFICATE

Provide documentation that the Owner requires in order to obtain a Code Compliance Certificate for the consented work.

1.21 TRADE GUARANTEES AND WARRANTIES

Where specific trade guarantees/warranties are offered covering materials and/or execution of proprietary products or complete installations, or are required as a condition of Building Consent, provide guarantees/warranties to the owner.

1.22 SITE ACCOMMODATION

Provide, erect and maintain scaffolding, sheds, toilets, water, power and hoardings. Allow for cartage, craneage, plant hire and storage. Arrange for temporary works and services necessary for the completion of the works.

1.23 HEALTH AND SAFETY

Make the works safe and provide and maintain a safe working environment, to the requirements of the Health and Safety at Work Act 2015. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

1.24 PROTECT THE WORKS

Protect parts of the work liable to damage until completion of the works. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.

1.25 STORAGE AND PROTECTION

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.

1.26 ANTIQUITIES AND ITEMS OF VALUE AND INTEREST

Report immediately the finding of any fossils, antiquities, pre-1900 items, or objects of value. Ensure they remain undisturbed until approval is given for their removal.

1.27 MEANS OF COMMUNICATION

All directions and approvals in writing.

1.28 PROGRAMME

Provide a programme for the contract works, including the work of separate contractors being carried out concurrently with this contract. Form of programme: A dated bar chart, identifying the contract work's critical path and all key dates for the provision of labour, materials and elements. Supply a copy of the programme, and any updates to the owner.

1.29 WORKING HOURS

Work on site is restricted to between 0800 to 1800, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by the owner.

1.30 RESTRICTIONS

Do not:

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

1.31 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.

1.32 DAMAGE AND NUISANCE

Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the TA and relevant Acts and Standards.

1.33 SET-OUT AND DATUM

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

1.34 EXECUTION OF THE WORK

Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

1.35 MATERIALS AND PRODUCTS

Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.

1.36 COMPATIBILITY

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.

1.37 COMPLETE ALL SERVICES

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

1.38 CLEAR AWAY

Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.

1.39 CLEAN

Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.

1233 DOCUMENTS REFERENCED

1 GENERAL

Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.
The latest edition of the cited document (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

1.1 ACTS AND REGULATIONS

Building Act 2004
Gas (Safety and Measurement) Regulations 2010
Health and Safety at Work Act 2015
Health and Safety at Work (Asbestos) Regulations 2016
Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)
Plumbers, Gasfitters and Drainlayers Act 2006

1.2 NEW ZEALAND BUILDING CODE VERIFICATION METHODS

NZBC E2/VM1	External moisture
NZBC G12/VM1	Water supplies

1.3 NEW ZEALAND BUILDING CODE ACCEPTABLE SOLUTIONS

NZBC B1/AS1	Structure - general
NZBC B2/AS1	Durability
NZBC C/AS2	Protection from fire
NZBC D1/AS1	Access routes
NZBC E1/AS1	Surface water
NZBC E2/AS1	External moisture
NZBC E2/AS3	External moisture
NZBC F2/AS1	Hazardous building materials
NZBC F7/AS1	Domestic smoke alarms
NZBC G1/AS1	Personal hygiene
NZBC G10/AS1	Piped services - Gas
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G13/AS2	Foul water - Drainage

1.4 NEW ZEALAND STANDARDS

AS/NZS 1604.3	Specification for preservative treatment - Plywood
NZS/AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 2455.1	Textile floor coverings - Installation practice - General
AS/NZS 2455.2	Textile floor coverings - installation practice - Carpet tiles
AS/NZS 2589	Gypsum linings - Application and finishing
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene pipe for hot and cold water applications
AS/NZS 2699.1	Built-in components for masonry construction Wall ties
AS/NZS 3000	Electrical installations (known as the Australian/NZ Wiring Rules)
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 4130:2009	Polyethylene (PE) pipes for pressure applications
NZS 3101.1	Concrete structures standard
NZS 3103	Sands for mortars and plasters
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Concrete surface finishes
NZS 3501	Specification for copper tubes for water, gas and sanitation
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand national timber grading rules
NZS 4210	Masonry construction materials and workmanship
NZS 4211	Specification for the performance of windows
NZS 4218	Thermal insulation - Housing and small buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live actions
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
NZS 4251.1	Solid plastering - Cement plasters for walls, ceilings and soffits
AS/NZS 4666	Insulating glass units
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS/NZS 5601.1	Gas installations - general installations
NZS 6803	Acoustics - Construction noise

1.5 BUILDING RESEARCH ASSOCIATION OF NEW ZEALAND (BRANZ)

Weathertight Solutions Vol. 2: Stucco
Good practice guide: Tiling
Good practice guide: Membrane roofing
Bulletin 441 - Sealed joints in external claddings - 2. Sealants
Bulletin 519 - Fasteners selection

1.6 OTHER DOCUMENTS

Cement & Concrete Association of New Zealand

- CCANZ CP 01: Code of practice for weathertight concrete and concrete masonry construction

WorkSafe New Zealand (OSH)

- Good Practice Guidelines - Excavation Safety
- Repainting lead based paints
- Management and Removal of Asbestos (Approved CoP)

Waterproofing Membrane Association Inc.

- WMAI CoPTM: Code of practice for torch-on membrane systems for roofs and decks

New Zealand Demolition and Asbestos Association (NZDAA)

- Best Practice Guideline for Demolition in New Zealand.

New Zealand Metal Roofing Manufacturers Inc

- NZMRM COP: NZ Metal roof and wall cladding: Code of practice

Window & Glass Association NZ (WGANZ)

- PQAS: Powder Coating Quality Assurance System
- Window Installation Guide: Guide to Window Installation as described in E2/AS1 Amendment 7.

3110 CONCRETE WORK

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade. Structural and foundation work to be carried out by or supervised by the appropriate LBP.

2 PRODUCTS

2.1 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 to AS/NZS 4671 Class E. Mild drawn steel tying wire not less than 1.2mm diameter.

2.2 MESH FOR SLABS TO NZS 3604 OR NZS 4229

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

2.3 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.

2.4 CONCRETE

Strength as selected. Ready-mix normal grade, maximum aggregate size 19mm to NZS 3104. Site mixed prescribed grade, using either separate batching of sand and coarse aggregate, or builder's mix, to NZS 3104.

3 EXECUTION

3.1 HANDLE AND STORE REINFORCING

Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean and free of 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.

3.3 CUT AND BEND

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars without written approval. Bend main reinforcing bars, stirrups and ties to the former pin diameters as given in NZS 3109, figure 3.1, **Standard bend, hook and stirrup**.

3.4 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 laid down in NZS 3109, 3.3.**Hooks and bends**.

3.5 LAPPED SPLICES

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

3.6 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground, mesh to be lapped and tied, so the outermost wires overlap by the greater of:- the spacing of the cross wires plus 50mm or, 150mm or, manufacturer's requirements. Do not count bar extensions beyond the outermost cross wire.

3.7 REINFORCEMENT COVER TO NZS 3604

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3604 requirements.

3.8 CONCRETE PLACEMENT

To comply with NZS 3109.

3.9 SURFACE FINISHES

To comply with NZS 3114, section 105 **Specification of finishes**, or as denoted on the drawings. Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Surface tolerances to comply with NZS 3114, section 104 **Surface tolerances** and 105.3.2.

3.10 DAMP-PROOF MEMBRANE

Apply 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.

3.11 CASTING IN

Build in grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required. Form pockets, chases and flashing grooves as required. No grounds exceeding 100mm in length. Minimum cover on conduits 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. Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion.

3.12 FLOOR SLABS TO NZS 3604

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**.
In the Canterbury Earthquake Region comply with the changes to NZS 3604 in NZBC B1/AS1.

3.13 SAW CUTS TO NZS 3604

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 ºC, and 48 hours for average ambient temperatures below 20 ºC). If saw cuts are not indicated on the drawings, than provide saw cuts as per the requirements for shrinkage control joints in NZS 3604.
For saw cuts filled with sealant, increase width of cut to suit sealant.

3.14 SURFACE REPAIRS

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

3.15 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.

3.16 STRIKE FORMWORK

Strike formwork without damaging or overloading structure.

3.17 CLEAN OUT

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

3800 TIMBER FRAMING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

Use experienced competent carpenter familiar with the materials and techniques specified. Work to be carried out by or supervised by the appropriate LBP.

2 PRODUCTS

2.1 TIMBER FRAMING GENERALLY

Species, grade and level of treatment to NZBC B2/AS1, NZS 3602, tables 1 to 3 **Requirements for wood-based building components** …, and moisture content to NZS 3602, table 4 **Allowable moisture content** ….. Structural Grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

2.2 TIMBER TRUSSES

To FTMA Code of Practice. Moisture content 16% at supply.

2.3 ACCESSORIES

Damp-proof course:	High impact embossed polyethylene
Stud straps	Polypropylene tape run horizontal at 300mm centres over flexible wall underlay, for drained cavities with stud spacings greater than 450mm.
Nails, bolts and screws:	Steel, stainless steel, galvanized steel of pattern to suit the location and to BRANZ BU 519: Fasteners selection. To NZS 3604, 4 **Durability** and NZBC E2/AS1.
Nail plates connectors:	Stainless steel and/or galvanized steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604, 4 **Durability**. Galvanized steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604, 4 **Durability** and NZBC E2/AS1
Corrosion risk	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). For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

3 EXECUTION

3.1 ATTENDANCE

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

3.2 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content…**, for framing supporting interior linings:

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

3.3 EXECUTION GENERALLY

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

3.4 INSTALL FLOOR, WALL AND ROOF FRAMING

Floors and bottom plates framed and fastened to NZS 3604, 7 **Floors**. Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, 8 **Walls**. Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins to NZS 3604, 10 **Roof framing**. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, 9 **Posts**, and NZS 3604, 10 **Roof framing**.

3.5 BATTENS

For drained cavity construction nominal 20mm H3.1 cavity battens (non-structural) to NZBC E2/AS1, 9.1.8.4 **Cavity battens**.

4220 WALL CLADDING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using persons competent and experienced in the trade.

2 PRODUCTS

2.1 FIBRE CEMENT WEATHERBOARD

Cellulose cement autoclaved boards.

2.2 FIBRE CEMENT SHEET CLADDING

Cellulose cement autoclaved sheets.

2.3 FIBRE CEMENT SOFFIT LINING

Cellulose cement autoclaved sheets.

2.4 TIMBER FASCIAS AND BARGE BOARDS

As selected, or radiata pine to NZS 3631 for grading and to NZS 3602, table 2 **Requirements for wood-based building components…,** for selection and treatment.

2.5 ACCESSORIES

Wall underlay:	Breather type, waterproof.
Jointers:	To suit cladding type and thickness.
Nails, screws, fastenings:	Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: **Durability** and E2/AS1.

3 EXECUTION

3.1 MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content….**

3.2 EXECUTION GENERALLY

To NZBC E2/AS1 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 INSTALL WALL UNDERLAY

Fix to the manufacturer's requirements. Refer to 1213 SELECTIONS for type.

3.4 CAVITY BATTENS

As specified in the section 3800 TIMBER FRAMING, to suit the selected wall cladding and construction type.

3.5 INSTALL FIBRE CEMENT WEATHERBOARD

Install level, true to line and face, to the manufacturer's requirements and NZBC E2/AS1, 9.5 **Fibre cement weatherboards**.

3.6 INSTALL FIBRE CEMENT SHEET CLADDING

Install level, true to line and face, to the manufacturer's requirements, as detailed and NZBC E2/AS1, 9.7 **Fibre cement sheet**.

3.7 INSTALL FIBRE CEMENT SOFFITS

Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and capping moulds. Refer to the cladding manufacturer's literature for fixing details and fixings durability requirements to NZS 3604, section 4 **Durability**.

3.8 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

3.9 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1, 4.0 **Flashings**.

3.10 USE OF SEALANTS

Selection and use of sealants to follow BRANZ BU 601: Sealants for cladding joints.

3.11 COMPLETE

Complete all flashings, finishings and trim so the cladding system is completely weathertight.

4231HL JAMES HARDIE® LINEA™ CLADDING

1 GENERAL

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

- James Hardie® Linea™ Weatherboard cladding

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 Specificatior
Linea™ Oblique™ Weatherboard Vertical Installation Technical Specificatior
James Hardie® Technical Supplement - James Hardie® Claddings Installation to Steel Framing
James Hardie® Fire and Acoustic Design Manual
James Hardie® Bracing Design Manual
BRANZ Appraisal 446 - Linea™ Weatherboard Direct Fixed Cladding
BRANZ Appraisal 447 - Linea™ Weatherboard Cavity Cladding
BRANZ Appraisal 896 - Linea™ Oblique™ Weatherboard (Horizontal) Cavity Claddin
BRANZ Appraisal 897 - Linea™ Oblique™ Weatherboard (Vertical) Cavity Claddin
CodeMark™GM-CM30018 James Hardie® Linea™ Weatherboard Direct fixed and Cavity Cladding
CodeMark™GM-CM30059 James Hardie® Linea™ Oblique™ Weatherboard Cavity Claddin

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	Ask James Hardie™ on 0800 808 868

BRANZ appraisal is available at www.branz.co.nz.
CodeMark™ Certificate is available atwww.building.govt.nz

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER - LINEA™ WEATHERBOARD

Provide a material manufacturer/supplier warranty:

25 years:	For Linea™ 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 QUALIFICATIONS - NON-CODEMARK INSTALLATION

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

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie® maintenance requirements at completion of the work. Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the information.

Requirements - Linea™ Weatherboard with CodeMark™ Certificate

1.8 QUALIFICATIONS - LINEA™ INSTALLER

Installer to be experienced in the application and;

- 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.

1.9 LINEA™ WEATHERBOARD INSTALLATION CHECKLIST

Installer to complete, sign and provide a James Hardie® Installation Checklist incorporating the Certificate of Installation requirements of Global-Mark CodeMark Certification program. Contact James Hardie® for a copy of the Installation Checklist.

1.10 LINEA™ WEATHERBOARD INSTALLATION INFORMATION

Installer to comply with all the relevant information in;

- Linea™ Weatherboard Technical Specification; and,
- BRANZ Appraisal 446 or BRANZ Appraisal 447

Performance

1.11 PERFORMANCE, WIND

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

2 PRODUCTS

Materials

2.1 LINEA™ WEATHERBOARDS

James Hardie® Linea™ Weatherboards, bevel back, 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.

2.2 WALL UNDERLAY

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

2.3 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.

Components - Linea™ Weatherboards

2.4 SOAKERS

External metal corner soaker. Refer to SELECTIONS.

2.5 INTERNAL "W" MOULD 90

Etched primed aluminium extrusion.

2.6 INTERNAL "W" MOULD 135

Etched primed aluminium extrusion.

2.7 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated PVC, with upstands.

2.8 JH CORNER UNDER FLASHING

50 x 50mm PVC moulding.

2.9 CANT STRIP

Cant strip, uPVC profiled strip.

2.10 FILL

ADOS CRC Builders fill, two part exterior grade fill to finish over jolt head nails.

2.11 FLEXIBLE SEALANT

Bostik Seal N Flex-1 or Sikaflex AT Facade or Sikaflex MS sealant for tongue and groove joint at ends of Linea™ Weatherboards.

2.12 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. For fastener type refer to following clause(s).

2.13 GALV STEEL CONCEALED NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Hot-dipped galvanized, 60 x 3.15mm HardieFlex™ nails for Linea™ Weatherboard concealed nailing over cavity battens over flexible underlay into timber stud.

2.14 GALV STEEL FACE NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Hot-dipped galvanized, 75 x 3.15mm jolt head nails for Linea™ Weatherboard face nailing (with pre-drilling) over cavity battens over flexible underlay into timber stud.

2.15 JH WEATHERBOARD INTERNAL "W" CORNER

Anodised aluminium extrusion to flash behind cladding at internal corners.

2.16 STRIA™ ALUMINIUM CAVITY CLOSURE

Perforated aluminium moulding, with upstands.

2.17 VERTICAL JOINT FLASHING

James Hardie® aluminium flashing extrusion with channel used behind cladding at vertical joints to provide a negative detail.

Accessories

2.18 SEALANT

Silaflex AT-Facade sealant.

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 cover to keep dry until fixed.

3.2 HANDLING

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

3.3 SUBSTRATE - TIMBER FRAMING

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 - particular installations

3.4 FIRE RESISTANCE RATING

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

3.5 BRACING SYSTEM

Fix Linea™ Weatherboards to James Hardie® Bracing Design Manual.

Application - generally

3.6 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.

3.7 PENETRATIONS AND FLASHINGS

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

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

3.8 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 flexible sealant to tongue and groove joints as required.

3.9 INSTALL FLASHINGS

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

Completion

3.10 REPLACE

Replace all damaged or marked elements.

3.11 LEAVE

Leave work to the standard required for following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 CAVITY BATTENS

Timber species:	Radiata pine
Treatment:	H3.1

Linea™ Weatherboards

4.2 JAMES HARDIE® LINEA™ WEATHERBOARDS

Location:	Refer to Architectural Drawings for location
Brand/type:	James Hardie® Linea™ Weatherboard
Thickness:	16mm
Width:	180mm
Nailing:	Refer to items under 2.0 PRODUCTS

4.3 JAMES HARDIE® LINEA™ WEATHERBOARD SOAKERS

Size:	200mm long for 180mm WB
Material:	

4.4 PRIMER TO CUT ENDS

Type:	Dulux 1 Step, Acraprime 501/1, Resene Quick Dry or similar product. Select to ensure primer is compatible with paint system.

Finishing

4.5 PAINTING

Refer to painting section(s) for details.

4231HS JAMES HARDIE® STRIA™ CLADDING

1 GENERAL

This section relates to the supply and installation of **James Hardie®** Stria™ Cladding on a drained cavity.

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:

CLD	Ceramic Low Density
RAB	Rigid air barrier

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 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 3603	Timber structures standards
NZS 3604	Timber-framed buildings
NASH Standard Part 2	May 2019 Light Steel Framed Buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
James Hardie® Stria™ Cladding Timber Cavity Batten Technical Specification
James Hardie® Stria™ Cladding Technical Specification CLD™ Structural Cavity Batter
James Hardie® Stria™ Cladding Vertical Installation Technical specification
James Hardie® Fire and Acoustic Design Manual
James Hardie® Cladding to Steel Framing Technical Supplement

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	0800 808 868

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie® Stria™ Cladding (refer to James Hardie® product warranty.)

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of purchase of the material.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 SAFE WORKING

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
Relevant James Hardie® maintenance requirements.

Performance - Wind

1.9 PERFORMANCE - WIND

The design wind speeds/zones are to NZS 3604, up to and including Extra High Wind Zone. This is within the scope of James Hardie® literature and details.

2 PRODUCTS

Materials

2.1 STRIA™ CLADDING

James Hardie® Stria™ Cladding, low density autoclaved panel, 4200mm long x 405mm wide x 14mm thick, manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2. Both faces and all edges pre-sealed.

2.2 WALL UNDERLAY

For flexible wall underlays and rigid wall underlays, refer to the appropriate separate sections.

2.3 CLD™ STRUCTURAL CAVITY BATTENS

James Hardie® CLD™ Structural Cavity Batten, 2450mm long x 70mm wide x 19mm thick, manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2. Both faces and all edges pre-sealed.

2.4 CAVITY CLOSER / VENT STRIP

Refer to SELECTIONS.

Components

2.5 FASTENER

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

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

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

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

Refer to SELECTIONS for fastener types.

2.6 HORIZONTAL STRIA™ CLADDING COMPONENTS

Refer to SELECTIONS.

2.7 FILL

ADOS CRC Builders fill, two part exterior grade fill to finish over nail holes.

Accessories

2.8 SEALANT

Refer to SELECTIONS.

2.9 PAINT FOR SEALING CUT EDGES OF CLD™ STRUCTURAL CAVITY BATTENS

Refer to SELECTIONS.

2.10 PAINT FOR SEALING CUT EDGES OF STRIA™ CLADDING

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 PRE-CLADDING REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for specified finish. 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. Carry out such additional preparatory work as required to bring the substrate to suitable condition.

3.5 TIMBER FRAMING REQUIREMENTS

Check timber framing stud and nog spacing is in accordance with NZS 3604 and framing complies with NZS 3602. For projects with specific engineering design check compliance with AS/NZS 1170 and NZS 3603. Moisture content of framing must not exceed the requirements specified by NZS 3602 to minimize shrinkage and movement after panels are fixed.

Where 600mm spacing of studs apply provide an intermediate means of support for building underlay and insulation using either 75mm galvanised mesh or polypropylene tape. Not required where studs spaced at 400mm centres or where rigid air barriers are provided in place of building underlay.

3.6 CLADDING CLEARANCES

Bottom edge clearance of cladding, ground clearances and overhang to bottom plate to comply with the requirements of NZBC E2/AS1.

Installation

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - general

3.8 INSTALL CAVITY CLOSURE/VENT STRIP

Install cavity closure/vent strip in accordance with James Hardie® Stria™ Cladding Technical Specification. Install cavity closer at base of walls, on horizontal (or raking) open junctions and over openings (windows, meter boards, etc).

3.9 INSTALL CLD™ STRUCTURAL CAVITY BATTENS TO TIMBER FRAMING

Install James Hardie® CLD™ Structural Cavity Battens vertically to studs in accordance with James Hardie® Stria™ Cladding Technical Specification CLD™ Structural Cavity Batten. Fix CLD Structural Cavity Battens less than 400mm in length at 150 mm crs. Prime cut ends of battens.

3.10 PENETRATIONS AND FLASHINGS

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

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

3.11 INSTALL HORIZONTAL STRIA™ CLADDING TO CLD™ STRUCTURAL CAVITY BATTEN

Install cladding in accordance with James Hardie® Stria™ Cladding Technical Specification. Fix panels using combination nailing and adhesive method with a minimum of three nails per stud for each panel. Apply a 6mm thick continuous bead of adhesive sealant to the face of the batten, panel by panel, prior to fixing Stria™ Cladding. Finish nail heads flush with panel surface. Prime cut ends of cladding.

3.12 INSTALL JOINTING SYSTEMS

Install vertical, horizontal, internal and external corner joints in accordance with James Hardie® Stria™ Cladding Technical Specification.

3.13 INSTALL FLASHINGS

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

Completion & Commissioning

3.14 COMPLETION MATTERS

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

3.15 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS

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

Materials

4.1 JAMES HARDIE® CLD™ STRUCTURAL CAVITY BATTENS

Brand/type:	James Hardie® CLD™ Structural Cavity Batten
Size:	19mm thick x 2450mm long x 70mm wide
Batten spacing:	600mm CRS
Fastener type:	TBC
Fastener finish:	TBC
Fixing centres:	250mm CRS

4.2 JAMES HARDIE® STRIA™ CLADDING - INSTALLED HORIZONTALLY TO CLD™ STRUCTURAL CAVITY BATTEN

Location:	Refer Architectural Plans
Brand/type:	James Hardie® Stria™ Cladding
Size:	14mm thick x 4200mm long x 405mm wide
Fastener type:	Paslode 30 x 1.6mm C series Stainless Steel Brad Nails and adhesive sealant.

BUILDING CONSENT
GRANTED
4/12/2020
HUTT CITY COUNCIL

Components

4.3 HORIZONTAL STRIA™ CLADDING - VENT STRIP

Location: Refer Architectural Plans
Brand/type: uPVC

4.4 HORIZONTAL STRIA™ CLADDING - VERTICAL JOINT COMPONENT

Location: Refer Architectural Plans
Brand/type: Aluminuim Builder to confirm

4.5 HORIZONTAL STRIA™ CLADDING - EXTERNAL CORNER COMPONENT

Location: Refer Architectural Plans

Brand/type: Builder to confirm

4.6 HORIZONTAL STRIA™ CLADDING - WINDOW JAMB FLASHING

Location: Refer Architectural Plans
Brand/type: 305430 Aluminium Window Jamb flashing

Accessories

4.7 ADHESIVE SEALANT

Type: Builder to confirm

4.8 FLEXIBLE SEALANT

Type: Builder to confirm

4.9 PAINT - TO CUT ENDS OF CLD™ STRUCTURAL CAVITY BATTENS

Type: Builder to confirm

4.10 PAINT - TO CUT ENDS OF STRIA CLADDING

Type: Builder to confirm

Finishing

4.11 PAINTING

Refer to painting section/s for details.

4239JH JAMES HARDIE® SOFFITS

1 GENERAL

This section relates to the supply and fixing of **James Hardie®** products to the underside of exterior soffits, verges and eaves. It includes:

- James Hardie® Eclipsa™ Eaves Lining
- James Hardie® HardieFlex™ Eaves Lining
- James Hardie® HardieGroove™ Soffit Lining
- James Hardie® HardieSoffit™ Lining
- James Hardie® Villaboard™ Soffit Lining

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
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
NASH Standard Part 2	May 2019 Light Steel Framed Buildings

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
James Hardie® Eaves and Soffits Installation Manual
James Hardie® Fire and Acoustic Design Manual.

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	www.jameshardie.co.nz
Email:	info@jameshardie.co.nz
Telephone:	0800 808 868

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For James Hardie® HardieFlex Eaves lining
(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 QUALIFICATIONS

Workers / Installers / applicators 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.

1.6 SAFE WORKING

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

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

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 HARDIEFLEX™ EAVES LINING

James Hardie® HardieFlex™ Eaves Lining 4.5mm and 6mm thick cellulose fibre reinforced cement sheet. Manufactured to AS/NZS 2908.2 from Portland cement, ground sand, cellulose fibre and water.

Components

2.2 FASTENER TYPE

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

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

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

Components - HardieFlex™ Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIEFLEX™ NAILS

HardieFlex Nail, 40 x 2.8mm stainless steel or galvanized nail, Refer to SELECTIONS.

2.5 INSEAL TAPE

Inseal® 3259, 1.5mm thick x 50mm wide black compressible medium density closed cell foam tape.

2.6 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

Components - General

2.7 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of products dry and undamaged. Store on site, lay flat on a smooth level surface clear of the ground. Protect materials, finished surfaces, edges and corners from damage, water and moisture.

3.2 HANDLING

Move/handle goods in accordance with James Hardie® requirements. Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject and replace goods that are damaged or will not provide the required finish. Install materials in a dry state.

3.3 SUBSTRATE - TIMBER FRAMING

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

3.4 COMMENCE WORK

Do not commence work until the roof has been installed.

Application - general

3.5 SHEET LAYOUT

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

3.6 CUTTING SOFFIT CLADDING

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

3.7 CIRCULAR HOLE FORMING

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

3.8 IRREGULAR HOLE FORMING

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

3.9 INSTALL HARDIEFLEX™ EAVES LINING

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

3.10 BUTT JOINT

Paint sheet edges prior to installation.

3.11 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.12 FASTENER - SIZE AND LAYOUT

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

3.13 SEALANTS

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

3.14 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.15 COMPLETE

Ensure the work is complete with all components, accessories, trim, sealant and finishing properly installed so the soffit cladding system is completely weathertight.

3.16 REPLACE

Replace all damaged or marked elements.

3.17 CLEAN

Clean surfaces.

3.18 LEAVE

Leave work to the standard required for following procedures.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

Materials

4.1 HARDIEFLEX™ EAVES LINING

Location:	Refer to Architectural Plans
Brand/type:	James Hardie® HardieFlex™ Eaves Lining
Thickness:	4.5
Width:	Builder to confirm
Fixing Method:	Builder to confirm
Fixing type:	Builder to confirm
Joint detail:	Builder to confirm

Painting

4.2 PAINTING

Refer to painting section/s for details.

4310 ROOFING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Use experienced competent roofers familiar with the materials and techniques specified. Work to be carried out by or supervised by the appropriate LBP.

1.2 WIND AND EARTHQUAKE LOADINGS

Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604, section 5 **Bracing design**, and confirmed under 1212 COMPLIANCE.

2 PRODUCTS

2.1 METAL TILES

Profile, metal and finish as selected. Accessories, cappings, flashings, and fixings to match and to the roofing manufacturer's requirements.

2.2 ACCESSORIES

Tile battens:	Douglas fir or radiata pine, SG6, treated H1.2, size, spacing and fixing to NZS 3604, table 10.12, **Tile battens for all wind zones**.
Roof underlays:	As selected.
Nails, screws, fastenings:	Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4 **Durability** and NZBC E2/AS1.
Flashings:	As required.

3 EXECUTION

3.1 STORAGE

Stack roofing and accessories on clean, level areas of the site. Cover and protect from damage and from weather until ready to fix in place.

3.2 SET-OUT

Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features. Overlaps to face away from prevailing wind direction.

3.3 LAY ROOF UNDERLAY

Lay and fix to NZBC E2/AS1, 8.1.5 **Roof Underlays**.

3.4 TAKE CARE

Take care to avoid damaging pre-finished roofing both during and after fixing. Mark only with chalk or spirit-based pen. Wear only soft-soled shoes on the finished surface. Remove metal filings daily.

3.5 INSTALL TILE BATTENS

Install to the roofing manufacturer's requirements, with joints fully supported and staggered.

3.6 INSTALL METAL TILES

Cut with tools specified by the roofing manufacturer. Fold ends and seal cut edges of tiles and accessories without damaging their integrity or finish, all to the roofing manufacturer's requirements. Lap metal tiles and fix complete with matching accessories, flashed to roof features and penetrations; all to the roofing manufacturer's requirements.

3.7 FIXINGS AND SEALANTS

Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.

3.8 INSTALL COVERS AND FLASHINGS

Provide apron, verge and ridge flashings. Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC E2/AS1, 4.0 **Flashings**, NZBC E2/AS1: 5.0 **Roof/wall junctions**, and NZBC E2/AS1: 6.0 **Parapets**.

3.9 PENETRATIONS

Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.

3.10 COMPLETE

Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

3.11 CLEAR

Clear trade debris and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes.

4520 ALUMINIUM WINDOWS & DOORS

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

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

1.2 CERTIFICATION

Provide documentation that the windows and doors comply with NZS 4211 and safety glass complies with NZS 4223.3.

1.3 WIND LOADINGS

Refer to section 1212 COMPLIANCE for wind zone.

2 PRODUCTS

2.1 WINDOW AND DOOR REVEALS

As selected, manufactured to comply with NZS 4211. Timber jamb liners to NZS 3602.

2.2 FLASHINGS

To NZBC E2/AS1, 9.1.10 **Windows and Doors** and as required.

2.3 POWDER COATING FINISH

To Window & Glass Association NZ: Powder Coating Quality Assurance System. All finished surfaces to show uniformity of gloss and colour (to match sample) free of all coating defects.

2.4 SEALANT, GLAZING TAPE AND GASKETS

To the window manufacturer's requirements.

2.5 FIXINGS

Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.

3 EXECUTION

3.1 OPENING PREPARATION

Confirm framing openings (including jamb battens for direct fix cladding) on site for dimension, plumb and straightness prior to fabrication or ordering of aluminium joinery. Prepare and trim to Window & Glass Association NZ: Guide to Window Installation requirements. For openings over 600mm wide on cavity construction provide sill support bars.

3.2 EXECUTION GENERALLY

To NZBC E2/VM1 and NZBC E2/AS1. Install to the Window & Glass Association NZ: Guide to Window Installation requirements.

3.3 HANDLING

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

3.4 CORROSION PROTECTION

Seal or suitably coat cut ends and holes drilled in aluminium before the frames are installed. Before fixing, apply bituminous coatings, slips or underlays between dissimilar metals in contact, or aluminium in contact with concrete.

3.5 FIX FRAMES

Fix frames rigidly in place without distortion, to the window manufacturer's requirements and to NZBC E2/AS1, 9.1.10.8, **Attachments for windows and doors**, plumb, true to line and face, weathertight and with all openings operating freely.

3.6 DRAINAGE

Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.

3.7 GLAZING INSTALLATION

All glass held in aluminium beads and black PVC gaskets.

3.8 SAFETY GLASS INSTALLATION

Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223.3.

3.9 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 on head flashings to match window finish.

3.10 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. Provide a continuous internal air seal between reveals and framing, using sealant over a backing rod.

3.11 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. Permanent manifestations, if required, to NZS 4223.3, 2.2 Manifestation (making glass visible).

3.12 CLEAN GLASS AND FRAMES

Clean off or remove glass indicators at completion of the building. Clean glass inside and out to a shining finish. Clean down both sides of window and door frames using the methods required by the window and door manufacturer.

4610 GLAZING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

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

1.2 CERTIFICATION

If not supplied with windows, provide documentation that the safety glass complies with NZS 4223.3.

2 PRODUCTS

2.1 GLAZING TAPE

Pressure sensitive, self-adhesive vinyl foam tapes, selected to suit the glazing detail.

2.2 GLASS THICKNESS

As selected and to NZS 4223.1, NZS 4223.3, NZS 4223.4.

2.3 LAMINATED GLASS

To NZS 4223.3.

2.4 TOUGHENED GLASS

To NZS 4223.3.
Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas (balustrades etc) to reduce inclusion failure.

2.5 DOUBLE GLAZING

As selected and to AS/NZS 4666. and NZS 4223.2

2.6 MIRROR GLASS

Clear annealed mirror float glass, including silver, activation, passivation and two protective coats.

2.7 SETTING BLOCKS

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

3 EXECUTION

3.1 EXECUTION GENERALLY

To NZS 4223.1, and for human impact safety glazing to NZS 4223.3. Insulating glass units to AS/NZS 4666 and NZS 4223.2.

3.2 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

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

3.3 SAFETY GLASS INSTALLATION

Use in doors, sidelight panels, low level windows, bathrooms and all other locations to comply with NZS 4223.3.

3.4 INSTALL MIRRORS

Install mirrors as detailed. Seal to vanities and basins where required.

3.5 SAFETY

Indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type. Do not apply indicators other than whiting to the glass surface. Permanent manifestations if required, to comply with NZS 4223.3, 2.2 Manifestation (making glass visible).

3.6 CLEAN

Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

4710K KNAUF INSULATION SYSTEMS

1 GENERAL

This section relates to **Knauf Insulation** thermal and acoustic glasswool insulation systems including installation.
It includes:
Earthwool® glasswool insulation

- Earthwool® glasswool insulation: wall batt
- Earthwool® glasswool insulation: ceiling batt / rolls
- Earthwool® glasswool insulation: quilted underfloor batt
- Earthwool® glasswool insulation: underfloor roll with a wind wash barrier
- Earthwool® glasswool insulation: acoustic batt
- Earthwool® glasswool insulation: DriTherm® masonry slab

Jet Stream® MAX blow-in glasswool insulation

- Jet Stream® MAX wall cavity
- Jet Stream® MAX floor
- Jet Stream® MAX ceiling
- Jet Stream® MAX skillion roof
- Jet Stream® MAX internal wall
- Jet Stream® MAX mid-floor

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlay and roofing underlay.

Documents

1.2 DOCUMENTS

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

NZBC C/AS1-AS2	Protection from fire
NZBC H1/AS1	Energy efficiency
AS 1530.1	Combustibility Test for Materials
AS/NZS 3000	Electrical installations
AS/NZS 4859.1:2002	Materials for the thermal insulation of buildings - General criteria and technical provisions
AS/NZS 5110	Recessed Luminaire Barriers
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
NZS 4214	Methods of determining the total thermal resistance of parts of buildings
NZS 4218	Thermal insulation - Housing and small buildings
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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Knauf Insulation Product Guide New Zealand
Earthwool® glasswool insulation: wall and ceiling roll and batt Datasheets
Earthwool® glasswool insulation: acoustic batt Datasheet
Earthwool® glasswool insulation: ceiling roll Datasheet
Earthwool® glasswool insulation: quilted underfloor batt Datasheet
Earthwool® glasswool insulation: quilted underfloor batt installation instructions
Earthwool® glasswool insulation: underfloor roll with a wind wash barrier Datasheet
Earthwool® glasswool insulation: DriTherm® masonry slab
Earthwool® glasswool insulation: Installation Instructions
Jet Stream® MAX Walls, floors and skillion roofs Datasheet
Jet Stream® MAX Walls, floors and skillion roofs Application Guidelines
Jet Stream® MAX Ceilings Datasheet
Jet Stream® MAX Ceilings Application Guidelines
BRANZ Appraisal 648 - Earthwool® glasswool Insulation
BRANZ Appraisal 975 - Earthwool® glasswool insulation: quilted underfloor batt
CodeMark Certificate: Jet Stream® MAX and Supafil Cavity Insulation 30067
CodeMark Certificate: Jet Stream® MAX ceiling insulation 30068

Manufacturer/supplier contact details

Company:	Knauf Insulation New Zealand
Web:	www.knaufinsulation.co.nz
Email:	info.nz@knaufinsulation.com
Telephone:	0800 KNAUFI (562 834)
Technical support:	tech.nz@knaufinsulation.com
Customer service:	sales.nz@knaufinsulation.com

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
50 years: For unfaced Earthwool® glasswool insulation materials
15 years: For Earthwool® glasswool insulation: quilted underfloor batt
50 years: For Jet Stream® MAX glasswool materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS - EARTHWOOL® GLASSWOOL INSULATION

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

Performance - Fire properties

1.7 FIRE PROPERTIES - EARTHWOOL® GLASSWOOL INSULATION

Earthwool® glasswool insulation is non-combustible to AS1530.1. Earthwool® glasswool insulation meets the 30's Needle Flame test to AS/NZS 60695.11.5.

Compliance

1.8 CODEMARK CERTIFICATE

Jet Stream® MAX meets the requirements of the NZBC when used in accordance with the conditions and limitations of its Certificate of Conformity.
CodeMark Certificate: Jet Stream® MAX and Supafil Cavity Insulation 30067
CodeMark Certificate: Jet Stream® MAX ceiling insulation 30068

2 PRODUCTS

Materials - thermal insulation

2.1 EARTHWOOL® GLASSWOOL INSULATION: CEILING

Earthwool® glasswool insulation: ceiling batt and rolls to AS/NZS 4859.1:2002, NZS 4218, NZS 4243.1 and NZS 4220. Rectangular insulation ceiling batt and rolls made using recycled glass and with ECOSE® Technology.
Refer to SELECTIONS for location, type, R-value and thickness.

2.2 EARTHWOOL® GLASSWOOL INSULATION: WALL

Earthwool® glasswool insulation: wall batt to AS/NZS 4859.1:2002, NZS 4218, NZS 4243.1 and NZS 4220. Rectangular insulation wall batt and rolls made using recycled glass and with ECOSE® Technology.
Refer to SELECTIONS for location, type, R-value and thickness.

Components - Earthwool® glasswool insulation

2.3 WIRE NETTING

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

2.4 PLASTIC STRAPPING TAPES

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

Accessories - General

2.5 VAPOUR BARRIER

Refer to 4161 UNDERLAYS, FOIL AND DPC for vapour barrier.

3 EXECUTION

Conditions - Earthwool® glasswool insulation

3.1 STORAGE - EARTHWOOL® GLASSWOOL INSULATION

Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and compression. Do not use damaged or wet insulation material.

3.2 HANDLING - EARTHWOOL® GLASSWOOL INSULATION

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 - EARTHWOOL® GLASSWOOL INSULATION

Before starting installation of Earthwool® glasswool insulation check that the location and framing are dry, that the cavities are not interconnected and that mesh, wall and roof underlays and vapour barriers are in place. Install when the building is enclosed and when the construction materials have achieved the maximum permitted moisture content or less.

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 requirements. Install in housing to NZS 4218 and NZS 4246. Install in large buildings to NZS 4243.1 and NZS 4220. Do not cover vents. Allow a clear gap around metal flues as recommended by the fireplace manufacturer. Refer to manufacturer installation instructions and NZS 4246 for further details.

3.5 INSULATION CLEARANCES FROM SERVICES AND LIGHT FITTINGS - GENERAL

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

- The requirements of NZS 4246.
- The insulation is exposed to the source of heat or equipment etc.
- Insulation, has passed the needle flame test to AS/NZS 60695.11.5 and/or is non-combustible.
- Gaps to hot surfaces may have to be increased with non-compliant insulation and plastic/polymeric type insulation (EPS, XPS, PIR, etc), check with insulation manufacturer.
- Gaps to hot surfaces may be able to be reduced with non-combustible insulation, check with equipment manufacturer.
- "Secure insulation" if required means, glue, mechanical fix, or provide fixed barriers at gap edge of insulation to hold in place. Rigid or semi rigid insulation may only need a firm friction fit (secure loose pieces).
- Jet Stream® MAX (loose fill) will require fixed barriers to NZS 4246 and maintain gaps as required.

LIGHT FITTINGS

Type of fitting	**Minimum insulation clearance**	**Comments**
Unmarked recessed	100mm	New or old unmarked & unknown fittings and/or insulation. Secure insulation. For loose fill insulation, refer to NZS 4246 figure 8.
CA 80, CA 90 or CA 135 recessed	Abut in residential. 100mm in others and for loose fill insulation.	Do NOT cover the fittings. For residential loose fill insulation, refer to NZS 4246 figure 4. For Loose fill insulation, maintain 100mm clearance unless specifically stated otherwise by luminaire manufacturer.
IC, IC-F or IC-4 recessed	Abut in residential. 100mm in others and for loose fill insulation.	Cover in residential only except for residential loose fill insulation, refer to NZS 4246 figure 7. For Loose fill insulation, maintain 100mm clearance unless specifically stated otherwise by luminaire manufacturer. Do NOT cover in others
Independent control gear	Place on top of insulation except loose fill insulation & 50mm from fitting	If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc. For loose fill insulation, do not place control gear on insulation. Maintain clearance by placing guard around control gear, refer to NZS 4246 figure 15.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation. For loose fill insulation ensure guard maintains clearance.

INBUILT RECESSED HOT APPLIANCES

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

EXTRACTS, VENTS, PIPES & ROOF UNDERLAY

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

3.6 PREPARATION - EARTHWOOL® GLASSWOOL INSULATION

Allow insulation to re-loft/relax prior to installation. Where possible lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.7 CHECK VAPOUR BARRIERS

Ensure these form one homogeneous sheet vapour barrier and remain as such throughout the ensuing construction process.

3.8 CHECK WALL AND ROOF UNDERLAYS

Ensure these are dry, clean, undamaged and free of debris before being covered.

3.9 LAY PLASTIC STRAPPING TAPE

Lay at right angles across the framing at a minimum of 300mm centres, staple tape to each framing member with stainless steel staples.

Application walls - Earthwool® glasswool insulation

3.10 FIT EARTHWOOL® GLASSWOOL INSULATION - TIMBER FRAMING

Friction fit Earthwool® glasswool insulation: wall batt between framing members and linings. Cut on site to fill cavity and provide a close even fit. When cutting to fill a void, oversize by up to 10mm to ensure a tight fit. Ensure there is a friction fit on all faces of the insulation. If cavity depth is greater than the insulation nominal thickness, fix or strap the product to secure in accordance with installation instructions. Cut into smaller pieces for smaller spaces and around penetrations to achieve efficient thermal performance. Do not fold, tuck or compress the insulation. Refer to NZS 4246 for installation guidelines and Earthwool® glasswool insulation Product Data Sheets, for detailed installation instructions.

Application ceiling - Earthwool® glasswool insulation

3.11 FIT EARTHWOOL® GLASSWOOL INSULATION CEILING BATT - BETWEEN CEILING FRAMING

Friction fit Earthwool® glasswool insulation: ceiling batt between framing members. Cut across the roll to fit nogs and small spaces around penetrations. Leave no gaps and maintain full thickness of insulation over the whole of the installation. Leave gap around metal flues to the manufactures requirements.

3.12 CEILING INSULATION EDGE DETAIL

Where perimeter of ceiling space is too low to allow full depth of insulation plus the 25mm air gap to the underlay, provide reduced perimeter insulation to NZS 4246.6.2 and maintain the 25mm gap.

Completion

3.13 CLEAN UP

Clean up as the work proceeds. Ensure no spare off cuts or any other materials remain behind claddings or linings.

3.14 LEAVE

Leave work to the standard required by following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site. Earthwool® glasswool insulation packaging is recyclable.

4 SELECTIONS

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

Wall insulation

4.1 EARTHWOOL® GLASSWOOL INSULATION: WALL

Location:	Exterior walls
Brand:	Earthwool® glasswool
R-value:	R2.2
Thickness:	90mm

Ceiling insulation

4.2 EARTHWOOL® GLASSWOOL INSULATION: CEILING BATTS

Location:	Ceilings
Brand:	Earthwool® glasswool
R-value:	R3.2
Thickness:	155mm

5110 INTERIOR LININGS & TRIM

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 FRAMING MOISTURE CONTENT

Maximum allowable moisture content to NZS 3602, table 4 **Allowable moisture content…**

1.2 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation. Ensure building is weatherproof before lining work commences.

2 PRODUCTS

2.1 PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use, bracing use, fire rated use and water resistance use.

2.2 PLASTERBOARD ACCESSORIES

External angles:	Slim type 0.5mm galvanized steel.
Casing bead:	Slim type 0.5mm galvanized steel or PVC.
Cornice:	Plasterboard scotia type.
Nails:	Galvanized clouts 40mm x 2.5mm.
Screws:	40mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws
Jointing compound & paper tape:	To the board manufacturer's requirements.
Adhesive:	Multi-purpose water based wallboard adhesive.

2.3 FIBRE CEMENT SHEET

Cellulose cement autoclaved sheets.

2.4 PRE-FINISHED SHEET

Proprietary sheets with factory applied finish.

2.5 PLYWOOD

Appearance grade plywood sheet

2.6 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ BU 519: **Fasteners selection**.

2.7 INTERIOR FINISHING TRIM

Timber selection to NZS 3602, table 3 **Requirements for wood-based building components….** Profile as selected or to match existing. Jointer profiles to suit location.

3 EXECUTION

3.1 SUBSTRATE

To NZS 3604, section 8 **Walls**, section 10 **Roof framing**, section 12 **Interior linings**, section 13 **Ceilings**, and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.

3.2 CONFIRM LEVELS OF PLASTERBOARD FINISH

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained. Provide levels of finish as laid down in AS/NZS 2589.

3.3 LINE PLASTERBOARD CEILINGS AND WALLS

Line walls and ceilings with plasterboard sheets, fastened to the plasterboard manufacturer's requirements.

3.4 SPECIAL PLASTERBOARD LININGS

Line wet area walls with water resistant plasterboard sheets using adhesive and nail fixing to studs at centres to suit the surface finish. Form bracing panels using high density plasterboard sheets fixed with clout-washers and clouts and to conform to NZS 3604, 5.4 **Wall bracing design**, and 13.5 **Structural ceiling diaphragms**. Form sound rated panels following the sheet manufacturer's specifications and details for the required sound rating. Form fire rated panels following the sheet manufacturer's specifications and details for the required fire rating.

3.5 FIX PLASTERBOARD EXTERNAL ANGLES

Fix full length to external corners, with clouts at 100mm each side staggered.

3.6 FIX PLASTERBOARD CORNICE

Fix with adhesive and with joints scribe-fitted to the plasterboard manufacturer's requirements.

3.7 PLASTERBOARD JOINTING AND STOPPING

Fill joint recess with bedding compound, centre the paper tape, apply second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. Fill nail holes and flush up external angles with two successive coats of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. All to the plasterboard manufacturer's requirements.

3.8 LEVELS OF FINISH

Provide levels of finish to standards laid down by AS/NZS 2589 as follows:

Level 4:	For thin coating finishes (paint) and surfaces receiving light texture or wall covering finishes
Level 5:	Where specifically detailed for surfaces receiving thin coating finishes (paint).

3.9 INSTALL FIBRE CEMENT SHEET LININGS

Fix to timber framing with jointing as detailed and to the panel manufacturer's requirements.

3.10 INSTALL PREFINISHED SHEET LININGS

Adhesive fix to timber framing with selected jointers as detailed and to the panel manufacturer's requirements.

3.11 INSTALL TRIM

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber beads to wall/ceiling junctions, and other trim as detailed.

5230 INTERIOR DOORS & FRAMES

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Trades people qualified or experienced in 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, and stairs).

2 PRODUCTS

2.1 DOORS GENERALLY

As selected.

2.2 GLAZED DOORS

Solid timber framed and bead glazed.

2.3 INTERIOR CAVITY SLIDERS

Hollow core door within a proprietary cavity slider frame, with brand-matched sliding door gear.

2.4 INTERNAL JOINERY FRAMES

Fabricate as detailed.

2.5 DOOR HINGES

Type:	loose-pin zinc-plated steel
Size:	89mm
Material:	zinc-plated steel
Number:	3 hinges per door

2.6 INTERIOR SLIDING DOOR GEAR

To suit door size and weight and as detailed.

2.7 INTERIOR SLIDING-FOLDING DOOR GEAR

Bi-fold pattern to suit size and weight of doors and as detailed.

2.8 DOOR HARDWARE

As selected.

2.9 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ BU 519: **Fasteners selection**.

3 EXECUTION

3.1 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation. Ensure building is weatherproof before lining work commences.

3.2 FIT INTERNAL JOINERY FRAMES

Wedge and rigidly fix in place without distortion, plumb, and true to line and face.

3.3 INTERNAL CAVITY SLIDERS

Install in accordance with the door manufacturer's requirements.

3.4 FIT HARDWARE

Fit hardware selected and provided, all in accordance with the hardware manufacturer's requirements.

3.5 CHECK

Check and adjust operation of doors sets, hardware and furniture.

5313KL RONDO CEILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of Rondo Ceiling Systems. It includes;

- Rondo KEY-LOCK Concealed Ceiling System
- Rondo Drywall Concealed Ceiling System
- Direct-fix or fully suspended applications
- Non-fire rated and fire-rated systems
- Bulkhead, curved ceilings
- Seismic and acoustic designs

Documents

1.1 DOCUMENTS

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

NZBC B1/VM1	Structure general
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
AS/NZS 1170.2	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 2588	Gypsum plasterboard
AS/NZS 4600:2005	Cold formed steel structures
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Rondo Professional Design Manual
KEY-LOCK® installation guide

Manufacturer/supplier contact details

Company:	**Rondo Building Services Pty Ltd**
Web:	www.rondo.co.nz
Email:	steve.hardy@rondo.co.nz
Telephone:	09 636 5110

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For Rondo branded products against defects in materials under normal use.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.
Installation by a manufacturer's accredited installer, using the manufacturer's technical services. Accredited installers must be members of the AWCINZ. Provide evidence of experience, listing completed projects of similar size and complexity.

1.5 NO SUBSTITUTIONS

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

1.6 SHOP DRAWINGS

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

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

- Design calculations.
- Fully dimensioned elevations of all elements (minimum scale 1:20)
- Complete details of construction, connections and all support systems (minimum scale 1:10)
- Dimensions of all typical elements
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Provision for thermal movement
- Provision for seismic movement and movement under prevailing wind loads
- Bracing requirements, due to wind and seismic loads (indicate any design and construction work by others, to meet these requirements)
- Sequence of installation
- Co-ordination requirements with other work
- A full schedule of materials, finishes and componentry

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Supply information on the materials and method of cleaning the ceiling system over its expected life.

Compliance information (Additional options available)

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer / supplier warranty
- Producer Statement (PS3) - Construction from the applicator / installer
- Producer Statement (PS4) - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.9 LOADING CODE REQUIREMENT

To NZBC B1/VM1, AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, NZS .1170.5, AS/NZS 4600.

Performance - Wind (design by contractor)

1.10 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the wind pressure parameters of AS/NZS 1170.2. Refer to general section 1220 PROJECT for details.. Contact Rondo Building Services Pty Ltd for the engineering design service and Producer Statement - Design (PS1) for code compliance documents.

Performance - Seismic (design by contractor)

1.11 SEISMIC - SPECIFIC DESIGN

Design the system and its anchorages/fixings to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5.
Refer to general section 1220 PROJECT for details. Contact Rondo Building Services Pty Ltd for the engineering design service and Producer Statement - Design (PS1) for code compliance documents.

Quality control and assurance

2 PRODUCTS

Materials - Rondo KEY-LOCK Concealed Ceiling System

2.1 KEY-LOCK DIRECT FIX CEILING SYSTEM

KEY-LOCK ceiling system to AS/NZS 2785, hot-dip galvanized steel elements manufactured from steel strip to AS 1397.
Including furring channels, Direct fix clips for fixing to timber, steel and concrete. For suspension depths of up to 200mm.

2.2 PRIMARY SECTIONS

Rondo 25mm or 38mm top cross rail to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

2.3 FURRING BATTEN SECTIONS

Rondo furring/batten sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Components

2.4 DIRECT FIX CLIPS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.5 SECTION JOINERS

Hot-dip galvanized steel elements manufactured from steel strip to AS 1397.

2.6 RONDO WALL TRIM

Rondo wall trim sections to AS 1397. Steel grade and zinc coating class G2 Z275 to AS 1397.

Accessories

2.7 FASTENERS DIRECT FIX

8g-16 x 25mm (minimum) self drilling wafer head screws or 30mm clouts for fixing to timbers detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

2.8 SCREWS

25mm x 6 gauge non-rusting Type S self-drilling and self-tapping buglehead screws as detailed in Rondo Professional Design Manual and to Rondo Building Services Pty Ltd requirements.

Lining and Insulation

2.9 PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed to AS/NZS 2588. Refer to SELECTIONS for type and thickness.

2.10 LINING BOARD

Refer to SELECTIONS for type, thickness and finish.

2.11 INSULATION

Refer to SELECTIONS for type and thickness.

Access Panels

2.12 ACCESS PANEL

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of materials and goods and store on-site on a level, firm base and protect from airborne contaminants such as acid and salt spray.
Protect finished surfaces, edges and corners from damage. Do not drag Rondo steel members across each other, or across other materials.
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 SUBSTRATE

Ensure substrate is plumb, level and in true alignment. Do not start erection if the substrate will not allow work of the required standard. Complete any remedial work found necessary before starting light steel framing erection.

3.3 COMMENCING THIS WORK

Commencing this work means the substrate is accepted as allowing work of the required standard.

3.4 CO-ORDINATE SERVICES

Co-ordinate and co-operate with electrical and mechanical work to avoid conflict between suspension members and luminaires, diffusers, pipework and ducting. Confirm the provision of extra hangers and fixings.

Ensure co-operation with work in and above the ceiling, including the marking of specific ceiling tiles below major access points to above-ceiling services. Colour coded markings to follow the standards laid down by mechanical and electrical services.

3.5 SITE CONDITIONS

Do not begin installation until the building is closed in, fully glazed, the roof watertight, and mechanical and electrical duct work above the ceiling completed.

Installation/application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALL

Install the system to AS/NZS 2785 minimum standards and the ceiling manufacturer's requirements.

3.8 ACCESSIBILITY

Provide access to the ceiling system and the in-ceiling and above-ceiling services so that maintenance and removal of any part can be carried out without damage to the ceiling system or panels.

3.9 PENETRATIONS

Accommodate recessed light fittings, air conditioning outlets and other electrical and/or mechanical services that are fixed to or pass through the ceiling system. Provide independent support for these as necessary.

3.10 INSTALLATION - GENERAL

Installation to Rondo Professional Design Manual and Rondo Building Services Pty Ltd requirements. Fix, erect and fit to finish rigid, plumb, square and true to line and face.

3.11 SETTING OUT

Set out the framing work true to line and square before starting erection.

3.12 ISOLATE

Isolate dissimilar metals with neoprene sheeting, tape or pipe lagging.

3.13 LINING

Fix and finish lining boards to manufacturer's and Rondo Building Services Pty Ltd requirements. Install services before lining. Stagger sheet joins.

3.14 INSULATION

Install insulation to insulation manufacturer's and Rondo Building Services Pty Ltd requirements.

3.15 ACCESS PANEL

Install to Rondo Panther installation requirements.

Installation - Rondo KEY-LOCK Ceiling System

3.16 FLUSH CEILING

Install the Rondo KEY-LOCK suspension system to AS/NZS 2785 minimum standards, and the Rondo Professional Design Manual and KEY-LOCK® installation guide.
Screw-fix sheets to furring channel sections at the centres required by the ceiling lining manufacturer. Stagger joints and fully support on furring sections and primary sections at centres to suit the load and Rondo installation manual. Refer to 5113 PLASTERBOARD LININGS for plasterboard and stopping specification.

Completion

3.17 ROUTINE CLEANING

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

3.18 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

3.19 FINAL INSPECTION AND TESTING

3.20 HANDOVER

4 SELECTIONS

For further details on selections go to www.rondo.co.nz
Substitutions are not permitted.

Rondo KEY-LOCK Ceiling System

5410 FLOORS

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

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

2 PRODUCTS

2.1 PARTICLEBOARD FLOORING

Flooring grade high density resin bonded.

2.2 PLYWOOD FLOORING

Structural plywood for bracing and floors, F11, CD grade, sanded face, H3.2 CCA.

2.3 NAIL FIXING PARTICLEBOARD OR PLYWOOD

Hand-driven 60 x 3.15mm hot-dipped galvanized csk annular grooved flooring nails, or power-driven 65 x 2.87mm hot-dipped galvanized annular grooved flooring nails, along with one-component polyurethane based construction adhesive or elastomeric construction adhesive. Increase nail lengths for flooring over 21mm thick.

3 EXECUTION

3.1 LAY PARTICLEBOARD FLOORING

Fasten to the flooring manufacturer's requirements and NZS 3604, 7.2.3 **Wood-based sheet flooring**. Punch nails, fill holes, then sand with one coarse and one fine paper, hand sanding into corners.

3.2 LAY PLYWOOD FLOORING

Fix to the plywood manufacturer's requirements and to NZS 3604, 7.2.3 **Wood-based sheet flooring**. Punch nails, fill holes, then sand , hand sanding into corners.

5510 JOINERY FIXTURES & FITTINGS

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

To include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

2 PRODUCTS

2.1 TIMBER BOARDS AND FRAMES

Carefully sawn to minimise the inherent warping, twisting and bowing of the selected species and to give a finish suitable for clear finishing.

2.2 MEDIUM DENSITY FIBRE BOARD

Resin bonded wood fibre sheet with selected finish.

3 EXECUTION

3.1 TRANSIT AND DELIVERY

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather. Do not deliver fittings until floor, wall and ceiling surfaces are in place and the fittings can be placed in their final location.

3.2 FABRICATION QUALITY

Check site dimensions. Carry out machining within the practices required for the particular timber or wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's requirements. Work accurate, square and true to line and face.

3.3 FABRICATE JOINERY FITTINGS

Carry out jointing, dowelling and other operations necessary for the proper assembly of the fittings as detailed, with fixings concealed unless otherwise detailed. Use glue joints where provision for shrinkage is not required, with contact surfaces, glueing and pressure all applied to the glue manufacturer's requirements. Locate and drive connectors and fasteners to the bolt manufacturer's requirements. Scribe fit adjustable shelves with 4 shelf pins and locate force fit pin holes at 50mm maximum centres in solid cheeks. Hang doors on concealed hinges.

3.4 INSTALL FITTINGS

Scribe fit on site and install level, square, plumb and true to line and face.

6300 FLOOR COVERING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Use flooring trades people appropriately experienced with the materials and techniques specified.

2 PRODUCTS

2.1 ADHESIVES COMPATIBILITY

Use only compatible adhesives approved by the respective manufacturers.

2.2 RESILIENT FLOOR COVERING

Includes vinyl, linoleum or rubber, either sheet or tile

2.3 ACCESSORIES - RESILIENT FLOOR COVERING

Rigid sheet underlay:	Wood based sheet overlays for uneven timber floors
Primer and sealers:	To the adhesive manufacturer's requirements for the particular substrate.
Adhesive:	To the manufacturer's requirements.
Trims and edging:	As supplied by the manufacturer to complete the work.

2.4 CARPET

Textile floor coverings to, AS/NZS 2455.1 for broadloom or AS/NZS 2455.2 for tiles.

2.5 ACCESSORIES - CARPET

Rigid sheet underlay:	Wood based sheet overlays for uneven timber floors
Underlay:	To AS/NZS 2455.1 Soft underlay and underlays manufacturer's requirements.
Adhesives:	To the manufacturer's requirements.
Edge grippers:	To the manufacturer's requirements.
Tape:	To the manufacturer's requirements.
Trims and edging:	Binder bars, divider strips and nosings to complete the work.

3 EXECUTION

3.1 HANDLING AND STORAGE

Maintain materials and accessories undamaged and dry. Store any rolls and other material to manufacturers requirements, on level surfaces, in non-work areas that are enclosed, clean and dry. Avoid distortion, marking and damage to edges while shifting and handling materials and accessories. Do not use faulty or damaged material.

3.2 SUBSTRATE

Ensure the building is enclosed, wet work complete, finishes and trim complete, and good lighting available. Inspect the substrate to ensure it is of the standard required for work in this section.

3.3 TEMPERATURE

Acclimatize flooring to a room temperature above 16°C to manufacturer's requirements. In air-conditioned buildings run air-conditioning to flooring manufacturer's requirements. Turn off floor heating for at least 48 hours before and after laying.

3.4 LAYOUT

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

3.5 SURFACE PREPARATION - RESILIENT FLOORING

To NZS/AS 1884 including necessary repairs and sealing. Check for moisture content to NZS/AS 1884, Appendix A, and do not commence final sanding or laying until readings for the whole area show a maximum moisture content of, 75% RH for concrete, 14% for timber or 12% for timber with air conditioning. Clean surface.

3.6 SURFACE PREPARATION - CARPET

To AS/NZS 2455.1, section 2. including necessary repairs and sealing. Check for moisture content to AS/NZS 2455.1, Appendix B, and do not commence laying until readings for the whole area show a maximum moisture content of, 75% RH for concrete, 14% for timber or 12% for timber with air conditioning. Clean surface.

3.7 RESILIENT FLOOR LAYING

Carry out the whole of the work to NZS/AS 1884, and the flooring manufacturer's requirements.

3.8 RESILIENT FLOOR JOINTING

Provide the joints/seams described in 1213 SELECTIONS or the drawings, to NZS/AS 1884, and the flooring manufacturer's requirements.

3.9 RESILIENT FLOOR COVES

Pencil cove flooring to the specified height and finish off as detailed. Perform butterfly method to internal and external mitres. Joints to manufacturers requirements.

3.10 FIT RESILIENT SKIRTING

Fit skirting in accordance with the skirting manufacturer's requirements.

3.11 CARPET INSTALLATION, CONVENTIONAL SYSTEM

Install underlay to manufacturer's requirements, and lay at right angles to the carpet direction. 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. Fix trim.

3.12 CARPET INSTALLATION, DIRECT STICK SYSTEM

Direct stick, install to AS/NZS 2455.1, section 3. Apply adhesive evenly over the entire substrate surface to the carpet manufacturer's requirements. Lay carpet with all edges, selvages and joins tightly butted and completely bonded to the floor surface. Roll the carpet with a clean 25 kg roller and ensure complete contact with adhesive. Fix trim.

3.13 CLEAN

Upon completion clean to manufacturer's requirements.

6700 PAINTING

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work using competent and experienced painters.

1.2 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and if elimination or isolation is not possible, then minimise the hazards in this work. Refer to WorkSafe NZ publication, Repainting lead based paints, for the required procedures and precautions when treating or removing lead based paint, burning or sanding off paint, or using solvent based paint removers.

1.3 SELECTIONS

Confirm all selections, colours and finishes with the owner.

2 PRODUCTS

2.1 PAINT

As selected and to the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.

2.2 GAP FILLERS

Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.

3 EXECUTION

3.1 INSPECT SURFACES

Inspect surfaces being painted and report to the owner any that will not, after the preparatory work laid down by the paint manufacturer, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable painting work to proceed.

3.2 PROTECT

Cover up adjoining surfaces and areas liable to damage or over-painting.

3.3 REMOVE HARDWARE

Remove hardware and door/window furniture and replace on completion. Do not paint over permanently attached hinges, or any hardware items which cannot be removed.

3.4 PRIMING AND SEALING

Ensure that priming and sealing work needed before or during construction is carried out when required.

3.5 ENVIRONMENTAL CONDITIONS

Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.

3.6 SHARP EDGES, CRACKS AND HOLES

Repair as required by the paint manufacturer.

3.7 PREPARE SURFACES

Prepare surfaces as required by the paint manufacturer. Make good all damage and defects.

3.8 PAINT APPLICATION

Apply paint by brush and/or roller to suit the location of the coating and to the paint manufacturer's requirements. Do not spray on site without express permission.

3.9 MANUFACTURER'S MANUALS

Refer to the paint manufacturers' manuals and follow their preparation, sequence and application requirements applying to each system. Ensure all paint coats in any system are supplied by the same manufacturer.

3.10 SCUFF BETWEEN COATS

Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.

3.11 FINISHED PAINT SURFACES

Finished paint surfaces to show uniformity of gloss and colour, with the correct thickness for each coat, and freedom from painting defects. Ensure finished work is clean and free of any disfigurement.

3.12 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination.

3.13 REFIT HARDWARE

Refit hardware without damage to the hardware or the adjoining surfaces.

7120 WATER SYSTEM

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 POLYBUTYLENE WATER PIPE

Polybutylene tubing complete with fittings and accessories brand-matched to AS/NZS 2642.2.

2.2 CROSS LINKED POLYETHYLENE WATER PIPE

Proprietary high-density cross-linked polyethylene composite pipe and fittings to AS/NZS 4130:2009.

2.3 POLYPROPYLENE WATER PIPE

PP-R Polypropylene pipes complete with fusion welded fittings and accessories brand-matched to NZBC G12/VM1.

2.4 INSULATION FOR HOT WATER PIPES

Preformed closed cell foam.

2.5 WATER METER

Meter, gate valve and back flow prevention to the requirements of the network utility operator. Minimum 25mm OD Polyethylene cold water main. Allow to excavate, install and back fill for the water main.

2.6 VALVES AND FITTINGS

All valves and fittings required for the system, to NZBC G12/AS1.

2.7 WATER HEATERS

Generally to NZBC G12/AS1, 6.0 **Hot Water Supply Systems** as applicable. Refer to 1213 SELECTIONS/drawings for specific water heater.

3 EXECUTION

3.1 EXECUTION GENERALLY

Carry out work and tests as applicable to NZBC G12/AS1.

3.2 INSTALL POLYBUTYLENE/POLYETHYLENE/POLYPROPYLENE WATER SUPPLY

Type as selected. Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC G12/AS1, 5.0 **Water supply**. Conceal pipework and pressure test before wall linings are fixed.

3.3 OUTLET LOCATIONS

Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.

3.4 BACKFLOW PREVENTION

Fit back flow prevention devices to all outlets where it is possible for water or contaminants to backflow in to the potable water supply system.

3.5 INSTALL HOT WATER PIPE INSULATION

Insulate hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanized steel wire ties.

3.6 INSTALL WATER HEATER

Install where shown complete with all the necessary fittings to the water heater manufacturer's requirements and NZBC G12/AS1, 6.11 **Water heater installation**. Gas water heaters also to AS/NZS 5601.1 and NZBC C/AS1-AS2, 7.2 **Gas-burning appliances**.

3.7 PENETRATIONS

Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.

3.8 COMPLETION

Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

7150 SANITARYWARE, TAPWARE & ACCESSORIES

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 SANITARY FIXTURES, TAPWARE, APPLIANCES AND ACCESSORIES

Refer to 1213 SELECTIONS and drawings for product selections.

3 EXECUTION

3.1 EXECUTION GENERALLY

Carry out installation work and tests to AS/NZS 3500.2, as applicable.

3.2 INSTALL SANITARYWARE

Fit and install sanitaryware and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

3.3 INSTALL TAPWARE

Install tapware in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

3.4 INSTALL SHOWER CUBICLE

Install to NZBC G1/AS1 and in accordance with shower manufacturer's details and requirements. Ensure that screens and doors fit closely and accurately. Test for water egress around sides and base.

3.5 TEST

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

3.6 ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

7410 RAINWATER SPOUTING SYSTEM

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 LIAISON

Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.

1.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

2 PRODUCTS

2.1 PVC-U DOWNPIPES

Tubes, stand-off brackets and fittings brand matched and complete to the manufacturers specifications.

2.2 PVC-U SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

2.3 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

2.4 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES

Seam jointed and complete with stand-off brackets, galvanized screw fixed.

3 EXECUTION

3.1 INSTALL PVC-U SPOUTING AND DOWNPIPES

Fit and screw fix brackets, set to falls to outlets. Ensure solvent welded or rubber ring jointed spouting sections are complete with all fittings to the spouting manufacturer's requirements. Screw fix stand-off brackets, set pipes plumb and clear of the wall, solvent welded. Discharge into stormwater bends.

3.2 INSTALL ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED SPOUTING AND DOWNPIPES

Screw fix brackets, set to falls to outlets, with spouting joints silicone sealed and pop-riveted to the spouting manufacturer's requirements. Screw fix stand off brackets, set pipes plumb and clear of the wall, with joints silicone sealed. Discharge into stormwater bends.

3.3 ENSURE

Ensure rainwater services are operational, flashings complete and the building weathertight.

7420 SANITARY WASTE SYSTEM

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a certifying person under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, SOIL AND VENT PIPES

PVC-U pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

As selected and to the following details:

- 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

Carry out sanitary plumbing work and tests as applicable to:

- 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

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1. Discharge wastes into floor waste gully, drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to roof vents and vermin proof mesh to untrapped waste pipes.

3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework. Exterior roof and wall penetrations to NZBC E2/AS1.

3.5 TEST

Test soil and waste disposal systems to NZBC G13/AS1, to ensure no leakage exists and leave in working order.

3.6 ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

7430 DRAINAGE SYSTEMS

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.2 AS BUILT DOCUMENTS

Supply a 1:100 as-built drawing to the BCA and the owner on completion.

2 PRODUCTS

2.1 MATERIALS

Concrete:	17.5 MPa prescribed grade.
Reinforcement:	Grade 300 deformed bars.
PVC-U pipes:	PVC-U pipes bends, junctions, fittings and joints.
Field drains:	Plastic pipes for field drains perforated and coiled with filter fabric over.
Drainage/filling materials	
Granular fill:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
Selected fill:	Fine grain soil or granular material suitable for bedding, excluding topsoil.
Ordinary fill:	Top soil or other excavated materials.

2.2 FITTINGS

Gully traps:	To NZBC G13/AS2, 3.3 **Gully traps**, complete with grating.
Strip drain channel:	Proprietary, modular, variable invert, PVC-U or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.

3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 EXECUTION GENERALLY

Carry out drainage work as applicable to:

- NZBC G13/AS2 and NZBC E1/AS1.

3.4 LAY WASTEWATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the NUO's sewer. Set inspection fittings on a concrete base.

3.5 INSTALL GULLY TRAPS

Set on concrete 50mm above surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

3.6 TESTING

Complete all tests to G13/AS1, 7.1 Test Methods for sanitary drainage, and to E1/AS1, 8.0 Drain Leakage Tests for stormwater drainage. Field test drains for watertightness to the satisfaction of the BCA inspector.

3.7 BACKFILL

Backfill drain lines in 150mm layers, well tamped but without disturbing the drains. Finish off garden areas with 150mm of topsoil, slightly mounded above the finished ground line. Public roads and footpaths to be made good to the controlling authority requirements.

7700 ELECTRICAL

1 GENERAL

Refer to 1213 SELECTIONS/drawings for specific product, material, accessories and finish selections.

1.1 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000 for listed and prescribed work and with the NUO's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.2 QUALIFICATIONS

Carry out work by or under the direct supervision of an electrical licensed supervisor under the Electricity (safety) Regulations 2010.

1.3 ELECTRICAL CERTIFICATE OF COMPLIANCE

Provide, prior to connection, a Certificate of Compliance (CoC) as required by the Electricity (Safety) Regulations 2010, to the owner and if required to the NUO. Allow the NUO to view before the meter installation, listed work inspection, polarity check and livening of supply.

1.4 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.

1.5 SAFETY OF INSTALLATION

When required by the Electrical (Safety) Regulations 2010, before installation work commences, provide a Certified Design to Electrical (Safety) Regulations 2010, regulations 58. This will may not be required for domestic installations or Low Risk Work.

2 PRODUCTS

2.1 METER BOARD / DISTRIBUTION BOARD / SUB BOARD

Proprietary manufactured meter board complete with flashing kit. Proprietary manufactured distribution board, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB's, RCD's and main switch. All protective devices: 6kA MCB's of the appropriate rating. Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure is maintained.

2.2 MAIN SUPPLY

Excavate, lay underground mains to NUO requirements, install cable marker, back fill. Public roads and footpaths to be made good to the controlling authority requirements.

2.3 CABLES

Tough plastic sheathed copper conductors. Minimum sizes are indicated below. Increase these as necessary due to method of installation, cable length or load.

Lighting circuits: 1.5mm2 on 10 amp MCBs for domestic construction
Power circuits: 2.5mm2 on 16 amp MCBs for domestic construction

2.4 ELECTRICAL ACCESSORIES

As selected and to the following details:

Switch units	Minimum 16 amp, 230 volt flush polycarbonate units. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2-way units refer to the electrical drawings.
Switched socket units:	10 amp, 230 volt flush polycarbonate 3 pin combined switch units.
Hot water system switch:	One way 20 amp switch complete with clamp for flexible PVC conduit.
Stove/range socket outlet and switch:	32 amp, 230 volt flush polycarbonate 3 pin combined switch unit, with remote isolating switch.

3 EXECUTION

3.1 CABLING

Install with a maximum of 10 light outlet units or 6 switched socket units on any circuit. Separate circuits for all electric heating appliances. 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. Provide earth bonding and main earth.

3.2 INSTALL SWITCH AND SOCKET UNITS

Fit single and double switch units and socket units level and plumb where shown on the drawings. Install at the following heights (to the centre of the unit) unless shown otherwise on the drawings or to match existing.

Switch Units:	1000mm above floor
Socket Units:	400mm above floor
	150mm above work benches

Mount switches vertically and socket units horizontally. Label switch units which control electrical equipment by engraving on the rocker switch.

3.3 INSTALL LIGHT FITTINGS

Install selected light fittings in the locations and heights shown on the drawings and in accordance with the fitting manufacturer's requirements. Recessed fittings to AS/NZS 3000, types IC-F, IC, CA-80 or CA-135 only (no clearance to insulation required for these types).

3.4 ELECTRIC HOT WATER SYSTEM

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end.

3.5 WIRE FOR PLUMBING FITTINGS

Wire for fittings to the Electricity (Safety) Regulations 2010 and to the fitting manufacturer's requirements.

3.6 INSTALL DOMESTIC SMOKE ALARMS

Install alarms to NZBC F7/AS1, 3.3 Location of smoke alarms, and to manufacturer's requirements, fitted neatly and without damage to the surrounding finish.

3.7 INSTALL EXTRACT SYSTEMS

Install extract fans, rangehoods, ducts and grilles to NZBC G4/AS1 and manufacturer's requirements.
Household extracts for cooktops, showers and baths to have a minimum flow rate (in fans and ducts) to NZBC G4/AS1 of:

- 25 L/s for showers and baths
- 50 L/s for cooktops

3.8 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire selected fittings and equipment to the Electricity (Safety) Regulations 2010 and the individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment.

3.9 COMPLETION

Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.