Project Design Consulting Ltd

P R O J E C T S P E C I F I C A T I O N

LSG SKYCHEFS - QUEENSTON

TEX SMITH LANE

FRANKTON

Issued for Consent

10-06-26

PROJECT OVERVIEW

Scope

Addition of three modular buildings with covered walkway, internal wall removal, mechanical & plumbing modifications, replacement walk in cool room and existing cool room extension

Address

Site Address	LSG Sky Chefs, Tex Smith Lane Frankton
City	Queenstown
Lot #	Lot 4
DP #	DP 17314 Being PT LOT 2 DP 304345

Site Conditions

Wind Zone	Very High
Earthquake Zone	Zone 3
Exposure Zone	Zone B
Snow Loading Zone	Snow Loading Required

Related Parties

Client

LSG Skychefs New Zealand Limited

Phone 09 255 0700

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1 PRELIMINARIES & GENERAL

1.1 Establishment & Enabling

1.1.1 Site Establishment

1.1.1.1 Product Alternatives

Alternative products may be offered by the contractor and approved by the Client. Contractor to notify the Client in advance of procurement and installation

1.1.1.2 Project Drawings

This Specification is to be read in conjunction with Project Design drawings and all other project drawings and documentation

1.1.1.3 Project Design Drawings

Project Design Drawings to take precedence over this specification for all finishes

1.1.1.4 Safety

Comply with the Health and Safety at Work Act 2015 (HSWA), and with all relevant Health and Safety at Work Regulations 2016, and with all relevant WorkSafe New Zealand (WorkSafe) Approved Codes of Practice and WorkSafe Information and Guidance, in particular the 'OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry'.

Carry out all construction operations in accordance with the Contractor's project-specific Health and Safety Plan.

1.1.1.5 Site Inspection Assessment

The Contractor (and sub-contractors where appropriate) shall be deemed to have examined and inspected, prior to tender, the site and its surroundings, and to have satisfied themselves as regards to access to the site, the form and nature of the site, all existing services, structures and features on the site, the risk of injury or damage to property, and the nature and extent of the work and materials and methodologies necessary for the execution of the works.

1.1.1.6 Site Boundaries

Establish the accurate location of property boundaries prior to setting out the works.

1.1.1.7 Regulatory Authorities

Comply with all statutory obligations and regulations required by the Regulatory Authority controlling the execution of the works.

The work shall be carried out in strict compliance with the relevant consents and approvals issued by the controlling Territorial Authority (TA). No work shall be undertaken until all necessary consents and approvals have been obtained.

Accept responsibility for notifying the Territorial Authority and arranging for any inspections and testing and commissioning procedures required by them at various stages of construction.

1.1.1.8 Network Utility Operators

The work shall also be carried out in accordance with all network utility operators having jurisdiction over utilities in or around the site.

Notify the network utility operators of the proposed works and ascertain and become familiar with any particular requirements and the location of existing services prior to commencing site operations.

Attend on network utility operators as necessary to obtain approvals (in addition to Building Consent approval) for the satisfactory completion of the works.

Accept responsibility for notifying network utility operators and arranging for any inspections and testing and commissioning procedures required by them at various stages of construction.

1.1.1.9 Existing Services

Locate all existing services before commencing work in any area, and locate all underground services affected by the contract works. Any detail of an existing private underground service provided by the owner is done so in good faith.

As necessary:
- obtain all records of existing underground services held by the relevant utility network operators;
- give all required notices to the service authorities or companies and the Territorial Authority, and pay all relevant fees and charges;
- carry out a detection survey of the site to ensure there are no buried operative electric cables;
- protect existing services on the site, and rectify any damage or interference to them, and provide temporary services while repairs are being carried out;
- extinguish and remove existing services designated redundant by the contract works.

1.1.1.10 Access to Existing Buildings undergoing Alterations

Control access at all times to working areas within existing buildings where alterations are included in the scope of the contract work. Liaise with the building owner to establish any site limitations required while the work is being carried out.

1.1.1.11 Hoardings, Gantries, Lighting

Provide temporary fencing, hoardings, planked footways, guard rails, gantries and lighting as necessary to protect the public and others, for the proper execution of the works and to meet the requirements of the Regulatory Authority and relevant Regulations and Acts.

1.1.1.12 Setting Out

Accept responsibility for the correct and accurate setting out of the works to conform to the drawings, and that specified locations, orientations, depths and levels are strictly adhered to.

As necessary, locate and verify survey marks and datum points and maintain their accurate position.

Establish reference points, datums, profiles or similar clear of excavations and to allow for easy and accurate checking at all stages of construction. Ensure these are not damaged or dislodged during construction operations.

Where required, employ a licensed cadastral surveyor to establish and set out the positions of the foundations, grid lines and floor levels.

Where required, issue to the Building Consenting Authority a copy of the surveyor's certificate (Pegging Certificate or Building Location Certificate) in accordance with the conditions of the Building Consent.

1.1.2 Temporary Works & Services

1.1.2.1 General

Make provision for all temporary works and services required for the satisfactory completion of the contract works.

Pay all associated costs and fees; carry out all necessary maintenance, alterations and servicing requirements; and remove temporary works and services on completion of the contract works. Temporary works and services shall comply with the requirements New Zealand Building Code.

1.1.2.2 Site Electricity

Make all necessary arrangements for the availability and connection of temporary electrical power required for operating site facilities and amenities, health and safety and security requirements, and plant operation and general construction use in strict accordance with electrical regulations.

Comply with the network utility operators requirements, and be responsible for maintaining and servicing temporary electrical distribution plant and equipment as necessary.

1.1.2.3 Site Perimeter Fencing

Provide and maintain all necessary fencing at the perimeter of the site in accordance with NZBC F5/AS1, prior to commencing the works, in order to prevent unauthorised entry by the public onto the site.

Site fences adjacent to public spaces shall:
- extend at least 2.0m from ground level on the side accessible to the public; and
- have a maximum 100mm gap between bottom of the fence and ground; and
- be constructed of galvanised chainlink netting with maximum 50 x 50mm grid size; and
- have posts spaced apart at maximum 2.5m.

1.1.2.4 Site Perimeter Hoardings

Provide and maintain all necessary hoardings at the perimeter of the site in accordance with NZBC F5/AS1, prior to commencing the works, in order to prevent unauthorised entry by the public onto the site.

Site hoardings adjacent to public spaces shall:
- extend at least 2.0m from ground level on the side accessible to the public; and
- have a maximum 100mm gap between bottom of the hoarding and ground; and
- have continuous cladding in any of the following materials:
  - close-butted timber at least 19mm thick; or
  - 6mm exterior-grade plywood on studs spaced at maximum 600mm centres; or
  - 9mm exterior-grade plywood on studs spaced at maximum 1000mm centres; or
  - continuous metal cladding constructed with studs and rails to provide comparable strength and rigidity.

1.1.2.5 Site Cleaning & Waste Management

Accept responsibility for and make all necessary provisions for periodic site cleaning, and for the management and disposal of all construction waste material, recyclable waste, and materials requiring special disposal during the contract period.

The Contractor and their subcontractors shall:
- conform to applicable regulations for disposal and removal of common and hazardous waste; and
- handle and dispose of all hazardous and banned materials in accordance with national and local regulations - such materials include, but are not limited to asbestos, underground storage tanks, polychlorinated biphenyls (PCBs), abandoned chemicals (petrol, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors and mercury-containing switches; and
- pay all associated disposal fees.

If a project-specific waste management plan is to be implemented and deployed, ensure that all site personnel, including management and staff, subcontractors and material suppliers, are fully aware of the specific procedures and requirements and have access to or copies of the waste management plan.

The disposal of rubbish and construction waste materials by burning on the site is NOT permitted under any circumstances.

1.1.2.6 Site Security

Accept responsibility for the security of the site, the works, plant and materials during and after working hours, over the period of the contract, and:
- take all reasonable precautions and make provision for the general security of the site, including unauthorised access to the site, to the works and to adjoining properties; and
- safeguard the site, the works, plant and materials from damage and theft.

1.1.2.7 Dust & Noise Control

Take measures to minimise nuisance from dust, noise and other causes affecting adjoining properties and the public.

Dust:
- The effects of dust shall be appropriately managed within the boundary of the site.
- Comply with the conditions of the Resource Consent/Building Consent related to dust control.

Noise:
- Permitted construction noise levels shall be less than the maximum limits required by the Territorial Authority and NZS 6803.
- Comply with the conditions of the Resource Consent/Building Consent related to noise control.
- As required, prepare a site-specific Construction Noise Management Plan.

1.1.3 Protection of Existing Features

1.1.3.1 Existing Buildings & Structures

Take all necessary precautions and make appropriate provisions to protect from damage and contamination any existing building or other structure within the site designated to remain intact while the contract works are being carried out.

1.1.3.2 Existing Site Services

Take all necessary precautions and make appropriate provisions to protect from damage and contamination existing services (buried, fixed, suspended) within the works area that are designated to remain intact while the contract works are being carried out.

Accept responsibility to:
- as required, cooperate with the requirements of the utility network operators; and
- provide as necessary all temporary covers, caps, etc., to prevent any moisture, dust and other contaminants entering service ducts, conduits, pipes, control boards, etc.; and
- ensure that manholes, pits, hydrants, tobys and other surface openings in the vicinity of the works are not concealed by construction amenities, plant, materials, etc.

1.1.3.3 Existing Fire Protection System

Take all necessary precautions and make appropriate provisions to maintain the integrity of existing fire protection system(s) designated to remain operational while the contract works are being carried out, and in accordance with any staging plan(s) programmed for the execution of the works.

If work requires the deactivation of the existing fire protection system, give notice in advance to the following persons/stake holders, follow their instructions, and reinstate the system to be operational to their requirements.

Give notice to:

1.1.3.4 Access Routes

Take all necessary precautions and make appropriate provisions to protect access routes through the building(s) and areas adjacent to work area(s) that are designated to remain in place and operational while the contract works are being carried out, and in accordance with any staging plan(s) programmed for the execution of the works.

Comply with Fire Egress and Territorial Authority requirements and conditions of the Building Consent at all times.

1.1.4 Traffic Control, Crossings & Plant

1.1.4.1 Traffic Control & Management

Comply with all Resource Consent/Building Consent conditions related to vehicular and pedestrian traffic movements and control.

The normal flow of traffic, including pedestrian traffic, on any public road or private access road, or railway, or property affected by the works, shall not be unreasonably interrupted during any operations covered by the contract.

Adequate safeguards to the public in respect of temporary fences, signals, signs and lights shall be provided by the Contractor at all times. Where traffic signs are necessary, these shall be provided and operated in accordance with the Regulatory Authority or NZ Transport Agency (NZTA) guidelines, as applicable, but erected only with the prior written approval of the Regulatory Authority or NZTA and the Contract Administrator.

Where a Traffic Management Plan (TMP) is required, prepare, operate and update this plan as necessary throughout the duration of the works. The TMP shall conform to the requirements of the Regulatory Authority or the NZTA, as applicable. Obtain TMP prior-approvals, and maintain the TMP for the entire construction duration.

Vehicle movements shall only take place during the hours of work specified elsewhere herein.

Provide adequate signs, safety cones, barriers, etc., to control on-site traffic entering restricted and dangerous areas, and as necessary for the movement and control of on-site traffic.

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

1.1.4.2 Plant & Equipment

Provide suitable temporary stormwater contamination control provisions in areas designated for the refueling and overnight parking of plant and equipment as will prevent pollution to stormwater courses, natural water ways and groundwater. Take all necessary measures to ensure that no hydrocarbons or other contaminants are allowed to drain to ground during any operation.

Any soils which may have been contaminated by hydrocarbons must not be spread on-site, but shall be disposed of in a controlled manner suited to the type and level of contamination, including, but not limited to, double bagging and disposal at a registered contaminated landfill, if appropriate.

Ensure all plant and equipment fully complies with relevant health and safety requirements at all times of operation.

Spare page

2 WATERPROOFING

2.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

2.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

3740:2010(AS)	Waterproofing of domestic wet areas
4858:2004(AS/NZS)	Wet area membranes

2.3 Mapei Waterproofing Systems

2.3.1 Scope

Supply and install the specified Waterproofing Systems from Mapei to the locations identified on the drawings, complete with accessories. All aspects of this work shall be in complete accordance with Mapei product technical literature (check www.mapei.co.nz, or call 09 921 1994 for the latest editions), associated Mapei BRANZ Appraisals, other relevant product manufacturers' recommendations, and as shown the drawings.

No substitutions are permitted for the specified Waterproofing Systems from Mapei.

2.3.2 Interior Wet-Area Waterproofing Membrane

Mapei Mapelastic AquaDefense. A ready-to-use, ultra- quick drying, flexible liquid membrane for internal waterproofing applications.

Where to use:
To form waterproofing layers before applying ceramic, stone and mosaic coatings in:
- bathrooms and shower cubicles;
- laundry rooms;
- saunas and damp interior environments in general.

Mapelastic AquaDefense may be applied on:
- concrete;
- cementitious screeds and screeds made using special binders (Topcem or Mapecem);
- H3 treated plywood (internal applications only);
- plasterboard (internal applications only);
- existing coatings in ceramic, terrazzo and stone;
- cementitious render.

Technical characteristics:
- Mapelastic AquaDefense is a totally solvent-free, ready-to-use ultra-quick drying, one-component light blue synthetic resin based paste in water dispersion.
- Mapelastic AquaDefense is easy to apply using a long-haired roller, brush or trowel on horizontal, sloping and vertical surfaces.
- Mapelastic AquaDefense is resistant to water, lime-water (ph >12), water containing chlorine and detergents commonly used for cleaning residential environments.

Recommendations:
- Do not apply Mapelastic AquaDefense if the temperature is lower than +5°C.
- Mapelastic AquaDefense must always be covered with ceramic, mosaic or stone.

Application of the product:
- Mapelastic AquaDefense must be applied in two even, coats (approx. 0.4 mm per coat) with a long-haired roller, brush or trowel.
- Wait until the first coat is dry, making sure the product becomes darker with a matt finish, before applying the second coat diagonally to the first (approximately 1 hour at +23°C and 50% relative humidity of the air and with substrates having residual humidity lower than 3%).
- The final thickness of the two coats of Mapelastic AquaDefense must be at least 0.8 mm in order to create a robust, flexible and continuous film.
- If Mapelastic AquaDefense is applied to form an anti-fracture membrane on cracked substrates, embed Mapetex Sel reinforcement in the first coat while it is still fresh.
- Ceramic, stone and mosaic tiles may be laid 4 hours after applying the second coat (at +23°C - 50% RH).

Application data (at +23°C and 50% RH):
- Minimum filming temperature: +5°C.
- Application temperature range: from +5°C to +35°C.
- Waiting time between 1st and 2nd coat: approx. 60 minutes.
- Waiting time before laying coating: 3-4 hours.
- Completely dry (1mm thickness): 12 hours.
- Colour: light blue.

Apply Mapelastic AquaDefense to properly prepared substrates in strict accordance with the manufacturer's requirements and BRANZ Appraisal No.484 (2018).

Installed location:

2.3.3 System Accessories

2.3.3.1 Mapeband - waterproof joint tape

Mapei Mapeband. A rubber tape with alkali-resistant fabric for cementitious waterproofing systems.

Where to use:
- Waterproofing corners between adjacent walls and between walls and floors before treating with Mapelastic, Mapelastic Smart or Mapegum WPS;

- Flexible waterproofing of expansion joints on terraces and balconies, etc. before treating with Mapelastic or Mapelastic Smart;
- Sealing pipes and drains in bathrooms, showers and kitchens in conjunction with Mapeband gaskets;
- Sealing expansion joints in precast panels.
- Joints between Mapeband strips must be sealed with Adesilex T Super or Adesilex LP.

Technical characteristics:
- Mapeband is a vapour and water-resistant rubber tape with fabric edging which is resistant to alkali;
- Mapeband is elastic and deformable even at low temperatures with excellent resistance to adverse weather conditions;
- Mapeband is resistant to alkalis, acids and salt solutions (for special cases, test before using).

Technical data:
- Tensile strength (EN12311-2, Method B) (N/mm²): >2.
- Ultimate elongation(EN12311-2, Method B): ≥300%.
- Tear resistance (EN 12310-2) (N): ≥100.
- In-service temperature range: from -20°C to +60°C.

Install Mapeband in strict accordance with the manufacturer's requirements.

Installed location:

2.3.4 Flexible Sealant

Mapei Mapeflex PU45. A one-component, rapid-hardening, paintable, thixotropic polyurethane sealant and adhesive with a high modulus of elasticity.

Where to use:
- Mapeflex PU45 has been specially developed for sealing expansion and distribution joints in horizontal and vertical surfaces, including those which are subject to occasional chemical attack provoked by hydrocarbons.
- Suitable for flexible bonds between similar and different materials most commonly used in the building industry for both internal and external applications and as a replacement or to integrate mechanical fasteners.

Application examples:
- For sealing expansion and distribution joints subject to movements up to 20% of the average width of the joint in:
- industrial floors subject to vehicular traffic, including heavy vehicles;
- concrete floors for internal and external car-parks, supermarkets, shopping centres and warehouses;
- ceramic flooring and coatings, including in areas subject to intense traffic such as supermarkets and industrial environments where fork-lifts are in use;
- concrete walls and general internal and external vertical structures where the use of a thixotropic product is required.
- For sealing cracks.

- For sealing general fillet joints.

Mapeflex PU45 may be used to bond most building materials, including:

- cement and cement-based products, cellular concrete, bricks, steel, copper, aluminium, general pre-painted surfaces, glass, mirrors, gypsum, wood and wood-based materials, ceramics, clinker, insulating material, plastics such as PVC, acrylic glass and fibreglass.

Application data (at +23°C and 50% RH):

- Application temperature range: from +5°C to +35°C.
- Dust dry: 90 minutes.
- Final setting: after 24 hours (per 3 mm of thickness) - 48 hours (per 4 mm of thickness).
- Colour: 111 grey.
- Shore A hardness (DIN 53505): 38.
- Resistance to UV rays: excellent.
- In-service temperature: from -40°C to +70°C.

Use Mapeflex PU45 in strict accordance with the manufacturer's requirements.

2.3.5 Warranty

2.3.5.1 Product Warranty

Mapei New Zealand Ltd Product Warranty Terms:

Mapei New Zealand Ltd (Mapei NZ Ltd) provides product warranties, if the products are installed in accordance with the products Technical Data Sheet (TDS) plans, specifications, and complies with the relevant provisions of the New Zealand building code.

Mapei NZ Ltd warrants that the product/s when prepared and applied in accordance with the TDS will have the properties and characteristics set out in the TDS and will retain these properties and characteristics for the duration of a warranty period.

A Person or Company applying the Mapei product (the Applicator) is not an agent or employee of Mapei NZ Ltd and therefore Mapei NZ Ltd takes no responsibility and assumes no liability for their workmanship.

Mapei NZ Ltd warranties do not cover installation, workmanship or product mixing and preparation aspects which is the responsibility of the Applicator.

Information relating to the application and use of Mapei products is given in good faith based on Mapei’s current knowledge and experience of its products when they are appropriately stored, handled and applied under recommended conditions according to the information in the product/s TDS.

A full list of all product warranty terms and conditions is available upon request.

2.3.6 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation work shall be carried out by experienced Mapei Approved Applicators, familiar with the specified products and installation techniques, to fully comply with all Mapei NZ Ltd warranty requirements and in accordance with the manufacturer's installation requirements, relevant Mapei BRANZ Appraisals, and as noted and detailed on the drawings. All work shall be such as to leave a neat, efficient, robust and waterproof installation.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades to install Mapei waterproofing products as required.

Application of the specified product(s) shall not be undertaken when the ambient temperature is outside the manufacturer's permissible temperature range. Exterior applications shall not be undertaken during inclement weather. As necessary, protect completed exterior work from rain and from hot dry winds and direct sunlight to aid proper drying and curing.

Protect adjacent finished work and surfaces from damage and contamination during installation. Leave completed surfaces clean, sound, and free of defects and damage.

2.3.7 Storage & Handling

Store Mapei waterproofing materials undercover, away from direct sunlight, on a flat, clean and dry surface. Keep Mapei products dry, out of direct sunlight and protected from damage, moisture and contamination while stored.

Do not use damaged, defective or contaminated products, or products that are beyond their designated shelf life.

Handle Mapei products in accordance with the manufacturer's requirements as set out in the relevant Technical Data Sheet(s) and in a manner that prevents contamination or deterioration of the material or reduces its performance.

Installers shall be familiar with and comply with the manufacturer's Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

2.3.8 Preparation

Requirements of substrates for the application of Mapei Liquid-Applied Waterproofing Membranes:
All substrates to be waterproofed shall be structurally sound, even and smooth, clean, dry, and free from dirt, dust, grease, oil, wax, paint residue, loose plaster and laitance, curing compounds and other materials and contaminants likely to affect the bonding and performance of the specified waterproofing membrane(s).

Carry out all necessary inspections and preparatory work to all substrates in accordance with the product's Technical Data Sheet prior to application.

Check that the substrate is free of voids and depressions, and is in correct alignment - true to line, level and/or plumb and to the falls indicated on the drawings.

Check that all embedded items are correctly installed, and that all substrate edges are completed as detailed.

Confirm the location of any movement control joints prior to commencement of the works, and ensure that they are appropriately trimmed - do not cover or bridge control joints with waterproof membranes - use only the manufacturer's recommended proprietary bond breaker tapes, flexible waterproofing bands, corners, sleeves and sealants.

Allow floor levelling compounds and mortar screeds to properly cure in accordance with the manufacturer's recommendations before commencing waterproofing.

The commencement of work on each section of waterproofing shall be deemed to indicate full acceptance by the Membrane Applicator that all preparatory works by other trades are appropriate to achieve the required finished results.

Preparation of Insitu Concrete Slabs for Mapei Liquid-Applied Waterproofing Membranes - check all aspects of preparatory works, including but not limited to:
- Check that the slab has been laid to the levels and falls indicated on the drawings.
- Concrete slab surface finishes must be compliant with NZS 3114 'U3 Surface Finish'.
- New concrete must have aged for a minimum of 28 days prior to application of the specified waterproof membrane(s).
- Old concrete must be thoroughly cleaned and washed and allowed to dry prior to application of waterproof membranes.
- Grind off any high spots, and using a proprietary levelling compound repair flush with feathered edges any low spots or damaged areas then grind smooth.
- Lightly grind any surface that is glazed to the extent that may compromise membrane adhesion.
- Leave the surface clean and free of dust and contaminants etc.
- Check that any protruding or exposed bare metal has been treated with a suitable corrosion-inhibiting primer.

Preparation of Water-Resistant Plasterboard Wet-Area Lining for Mapei Liquid-Applied Waterproofing Membranes - check all aspects of preparatory works, including but not limited to:
- Check that the plasterboard sheets have been correctly installed in accordance with the manufacturer's requirements, and that all sheet edges are fully supported.
- Check that all sheet joints and fastening heads are flush-filled with a suitable stopping compound.
- Check junctions with all other substrates and elements, ensuring that all necessary works have been completed as detailed.
- Check that all apertures, openings, edges and expansion and movement control joints are completed as detailed.

2.3.9 Application

2.3.9.1 Control Joints - liquid-applied membrane

Control joints in the substrate shall be extended through the tiling, and installed and completed to the layout and details shown on the drawings. Do not bridge control joints with underlays, membrane, adhesive or tiles. Confirm the location of all control joints before commencing installation.

2.3.9.2 Mapeband

Mapeband Waterproofing Joint Tape. Apply a uniform layer of Mapegum WPS or Mapelastic Smart waterproofing membrane, at least 1mm thick and sufficiently wider than the Mapeband tape, to the corner junctions and expansion joints to be waterproofed with Mapeband tape. Keep expansion joint gaps clean and free of Mapegum WPS.
While the waterproofing membrane is still wet, lay the Mapeband tape into the membrane firmly with a smoothing trowel. The tape must be sufficiently drooped into expansion joints to allow for potential movement.
Apply subsequent coats of Mapegum WPS to form a continuous waterproof membrane over the required area.

Repeat the application process for installing Mapeband pipe seal gaskets.

3 CARPENTRY

3.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

3.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1491:1996(AS/NZS)	Finger jointed structural timber
1859.1:2017(AS|NZS)	Reconstituted wood-based panels - Specifications - Part 1: Particleboard
1859.2:2017(AS|NZS)	Reconstituted wood-based panels - Specifications - Part 2: Dry process fibreboard
2097:2006(AS/NZS)	Methods for sampling veneer and plywood
2098.1:2006(AS/NZS)	Methods of test for veneer and plywood - Moisture content of veneer and plywood
2098.11:2005(AS/NZS)	Methods of test for veneer and plywood - Determination of formaldehyde emissions for plywood
2098.2:2012(AS/NZS)	Methods of test for veneer and plywood - Method 2: Bond quality of plywood (chisel test)
2098.3:2006(AS/NZS)	Methods of test for veneer and plywood - Bond quality and strength of scarf joints in plywood
2098.4:2006(AS/NZS)	Methods of test for veneer and plywood - Measurement of dimensions and shape for sheets of veneer and plywood
2270:2006(AS/NZS)	Plywood and blockboard for interior use
2271:2004(AS/NZS)	Plywood and blockboard for exterior use
2295:2006(NZS)	Pliable, permeable building underlays
2588:2018(AS|NZS)	Gypsum plasterboard
2589:2017(AS/NZS)	Gypsum linings - Application and finishing
2904:1995(AS/NZS)	Damp-proof courses and flashings
2908.2:2000(AS/NZS)	Cellulose-cement products - Flat sheets
3601:1973(NZS)	Metric dimensions for timber
3602:2003(NZS)	Timber and wood-based products for use in building
3603:1993(NZS)	Timber Structures Standard
3604:2011(NZS)	Timber-framed buildings
3617:1979(NZS)	Specification for profiles of weatherboards, fascia boards, and flooring
3622:2004(NZS)	Verification of timber properties
3631:1988(NZS)	New Zealand timber grading rules

3640:2003(NZS)	Chemical preservation of round and sawn timber
AS/NZS 1080.1:2012	Timber - Methods of test - Method 1: Moisture content
AS/NZS 1604.3:2012	Specification for preservative treatment - Part 3: Plywood
AS/NZS 2269.0:2012	Plywood - Structural - Part 0: Specifications

3.3 General

This section includes the receiving, stacking and storage of all Carpenter's materials and the fabrication, erection and fixing of all framing, sheathings and finishing timbers, including all work incidental to neatly finishing in other trades and all temporary work and temporary bracing.

The Carpenter shall attend upon all trades, and shall supply and fix all obviously necessary but not specifically mentioned fixings and materials.

3.4 Timber Framing

3.5 Plasterboard Sheet Linings

3.5.1 Scope

Supply, install and finish the selected Plasterboard Sheets as interior linings to the walls, ceilings, and other elements identified on the drawings, to the specified finish level, complete with accessories. All aspects of this work shall be in complete accordance with the Plasterboard Manufacturer's technical literature and installation guidelines, other relevant product manufacturers' recommendations, and as shown on the drawings.

3.5.2 Plasterboard

Standard Plasterboard, 13mm thick.

Location:
Manufacturer, brand name and type:

3.5.3 Fixings

Fix sheets with adhesive and bugle-head drywall screws in accordance with the Plasterboard Manufacturer's requirements.

Plasterboard adhesive. Use to adhere the sheets and accessories to the framing in accordance with the Plasterboard manufacturer's requirements.

Substrate:
Adhesive manufacturer, brand name & type:

3.5.4 Plasterboard Finish Level

Level 4 Finish, in accordance with AS/NZS 2589. Unless specified otherwise, all decorated plasterboard shall be finished to Level 4 Finish.
All joints and interior angles shall have shall have jointing tape embedded in jointing compound and

minimum of two separate coats of jointing compound applied over all joints, angles, fastener heads and accessories.
Jointing and finishing compounds shall be applied and finished evenly and free of ridges and tool marks in preparation for decoration in accordance with the manufacturer's requirements.
Agree in writing with the Decorator that a Level 4 Finish has been achieved when complete and before decorating commences.

Location:
Manufacturer, brand name and type:

3.5.5 Jointing Tape

Plasterboard sheet joints shall be reinforced with a suitable paper jointing tape compatible with the jointing and finishing compounds.

Manufacturer, brand name & type:

3.5.6 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades to ensure that appropriate clearances are allowed from adjacent internal linings, fixtures, products, and associated services, etc, that the sheets correctly allow for door and window installation, and that services penetrations are correctly handled to maintain sheet integrity.
Co-operate with the Decorator to ensure that the specified plasterboard finish level has been achieved before decoration commences.

3.5.7 Workmanship

Plasterboard installation and finishing work shall be carried out by experienced tradesmen familiar with the techniques and materials specified and in accordance with the manufacturer's installation requirements.
Plasterboard linings shall be finished to the specified finish level in accordance with AS/NZS 2589.
Make all necessary arrangements for the quality assessment of plasterboard finishes prior to commencing decorating.
Protect surrounding surfaces from jointing compound splashes and sanding dust.

3.5.8 Delivery & Handling

Store plasterboard sheets undercover inside a watertight building and keep sheets dry at all times.
Stack sheets flat on a dry level surface in accordance with the manufacturer's recommendations.
Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge. Do not use damaged or faulty sheets.
Handle and store plasterboard finishing materials and accessories in accordance with the manufacturer's requirements. Keep products dry and protect from damage. Do not use damaged or faulty products or products beyond their expiry date.

3.5.9 Preparation

Check that any timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with the Plasterboard Manufacturer's requirements.
Check that the building has been completely finished to all penetrations including doors, windows, services, etc. so that the sheets can be installed without being affected by any weather conditions.
Check junctions to all other building elements and ensure that all necessary works have been completed, eg; flooring, set-out of services, etc. that will enable the sheets and accessories to be installed.

Framing shall be plumb and in true alignment, complete and suitable for the sheets, with a maximum moisture content 18% or as recommended by the Plasterboard Manufacturer. Check that the framing is true to line and plane and with no projections due to structural and bracing bracketry etc. Ensure that framing brackets, plates, braces and hold-downs etc. are correctly installed.
Clear building debris and rubbish from framing voids and keep clean until plasterboard sheet linings are installed.

3.5.10 Installation

Install the sheets, complete with all accessories, to the framing in accordance with the Plasterboard Manufacturer's requirements, and as noted and detailed on the drawings.
Install all necessary metal beads and trim to corners and edges and control joints as required and as shown on the drawings.
Apply jointing and finishing compounds to the required build and specified finish level in accordance with the manufacturer's instructions. Reinforce joints with the selected jointing tape. Where required sand top coats smooth and even with fine sandpaper, as recommended by the manufacturer, when completely dry.

3.5.11 Completion

Ensure that the plasterboard sheets have been installed correctly and finished to the specified finish level. Check for damage and replace as necessary. Ensure that assessment of the plasterboard finish level has been carried out and that agreement that the finish level is acceptable for subsequent decorating has been provided.
Clean up thoroughly on completion and remove all waste and rubbish from site.

3.6 Workmanship & Materials

3.7 Plasterboard Sheet Linings

3.7.1 Scope

Supply, install and finish the selected Plasterboard Sheets as interior linings to the walls, ceilings, and other elements identified on the drawings, to the specified finish level, complete with accessories. All aspects of this work shall be in complete accordance with the Plasterboard Manufacturer's technical literature and installation guidelines, other relevant product manufacturers' recommendations, and as shown on the drawings.

3.7.2 Performance

To the areas noted as 'Bracing' on the drawings; additionally comply with all relevant aspects of the Plasterboard Manufacturer's installation requirements to the specified bracing unit rating, complete with all system accessories, and other relevant product manufacturers' recommendations.

To the areas noted as 'Fire-rated' on the drawings; additionally comply with all relevant aspects of the Plasterboard Manufacturer's requirements to the specified FFR rating, complete with all system accessories, and other relevant product manufacturers' recommendations.

3.7.3 Plasterboard

Standard Plasterboard, 13mm thick.

Location:
Manufacturer, brand name and type:

Bracing Plasterboard, 10mm thick.

Location:
Manufacturer, brand name and type:

Bracing Plasterboard, 13mm thick.

Location:
Manufacturer, brand name and type:

Fire Resistant Plasterboard, 10mm thick.

Location:
Manufacturer, brand name and type:

Fire Resistant Plasterboard, 13mm thick.

Location:
Manufacturer, brand name and type:

Water Resistant Plasterboard, 13mm thick, for wet areas.

Location:
Manufacturer, brand name and type:

3.7.4 Fixings

Fix sheets with adhesive and bugle-head drywall screws in accordance with the Plasterboard Manufacturer's requirements.

Plasterboard adhesive. Use to adhere the sheets and accessories to the framing in accordance with the Plasterboard manufacturer's requirements.

Substrate:
Adhesive manufacturer, brand name & type:

3.7.5 Plasterboard Finish Level

Level 4 Finish, in accordance with AS/NZS 2589. Unless specified otherwise, all decorated plasterboard shall be finished to Level 4 Finish.
All joints and interior angles shall have jointing tape embedded in jointing compound andminimum of two separate coats of jointing compound applied over all joints, angles, fastener heads and accessories.
Jointing and finishing compounds shall be applied and finished evenly and free of ridges and tool marks in preparation for decoration in accordance with the manufacturer's requirements.
Agree in writing with the Decorator that a Level 4 Finish has been achieved when complete and before decorating commences.

Location:
Manufacturer, brand name and type:

3.7.6 Jointing Tape

Plasterboard sheet joints shall be reinforced with a suitable paper jointing tape compatible with the jointing and finishing compounds.

Manufacturer, brand name & type:

3.7.7 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades to ensure that appropriate clearances are allowed from adjacent internal linings, fixtures, products, and associated services, etc, that the sheets correctly allow for door and window installation, and that services penetrations are correctly handled to maintain sheet integrity.
Co-operate with the Decorator to ensure that the specified plasterboard finish level has been achieved before decoration commences.

3.7.8 Workmanship

Plasterboard installation and finishing work shall be carried out by experienced tradesmen familiar with the techniques and materials specified and in accordance with the manufacturer's installation requirements.
Plasterboard linings shall be finished to the specified finish level in accordance with AS/NZS 2589.
Make all necessary arrangements for the quality assessment of plasterboard finishes prior to commencing decorating.
Protect surrounding surfaces from jointing compound splashes and sanding dust.

3.7.9 Delivery & Handling

Store plasterboard sheets undercover inside a watertight building and keep sheets dry at all times.
Stack sheets flat on a dry level surface in accordance with the manufacturer's recommendations.

Avoid damage to sheet edges, ends, and surfaces. Carry all sheets on edge. Do not use damaged or faulty sheets.
Handle and store plasterboard finishing materials and accessories in accordance with the manufacturer's requirements. Keep products dry and protect from damage. Do not use damaged or faulty products or products beyond their expiry date.

3.7.10 Preparation

Check that any timber framing elements are in accordance with NZS 3604, or in accordance with NZS 3603 and AS/NZS 1170 for specific design, and in accordance with the Plasterboard Manufacturer's requirements.
Check that the building has been completely finished to all penetrations including doors, windows, services, etc. so that the sheets can be installed without being affected by any weather conditions.
Check junctions to all other building elements and ensure that all necessary works have been completed, eg; flooring, set-out of services, etc. that will enable the sheets and accessories to be installed.

Framing shall be plumb and in true alignment, complete and suitable for the sheets, with a maximum moisture content 18% or as recommended by the Plasterboard Manufacturer. Check that the framing is true to line and plane and with no projections due to structural and bracing bracketry etc. Ensure that framing brackets, plates, braces and hold-downs etc. are correctly installed.
Clear building debris and rubbish from framing voids and keep clean until plasterboard sheet linings are installed.

3.7.11 Installation

Install the sheets, complete with all accessories, to the framing in accordance with the Plasterboard Manufacturer's requirements, and as noted and detailed on the drawings.
Install all necessary metal beads and trim to corners and edges and control joints as required and as shown on the drawings.
Apply jointing and finishing compounds to the required build and specified finish level in accordance with the manufacturer's instructions. Reinforce joints with the selected jointing tape. Where required sand top coats smooth and even with fine sandpaper, as recommended by the manufacturer, when completely dry.

3.7.12 Completion

Ensure that the plasterboard sheets have been installed correctly and finished to the specified finish level. Check for damage and replace as necessary. Ensure that assessment of the plasterboard finish level has been carried out and that agreement that the finish level is acceptable for subsequent decorating has been provided.
Clean up thoroughly on completion and remove all waste and rubbish from site.

3.8 Plywood Interior Linings

3.8.1 Scope

Supply and install the specified plywood products as interior plywood wall and/or ceiling linings to the locations, layout and details shown on the drawings, complete with all accessories required for proper

installation and finishing. All aspects of this work shall be in complete accordance with the manufacturer's technical literature and installation guidelines, other relevant product manufacturers' recommendations, and as shown on the drawings.

Refer to Painting & Decorating for applied finishes to interior interior linings.

The following is a list and a general description of the extent of Plywood Interior Linings work, which are more specifically defined in the contract documents, required for the completion of the contract works:

3.8.2 Requirements

3.8.2.1 Quality Assurance

It is the Contractor's responsibility to ensure that the installation and finishing of plywood linings comply in all respects with the approved design drawings and specifications, and Building Consent.

Maintain and comply with industry-recognised quality control and assurance procedures to ensure that all stages of work are carried out to the highest standard.

3.8.2.2 Defective Materials & Work

Should defective materials and/or work be found at any time before the final acceptance of the work, it shall be rejected. Rejected plywood lining materials and work shall be repaired and/or replaced to the satisfaction of the Architect/Designer, without delay and at no additional cost to the Principal.

3.8.2.3 Shop Drawings - Grid Suspension System (suspended ceiling)

When installed as a component of a ceiling grid suspension system, prepare and submit to the Architect/Designer for verification and approval Shop Drawings covering the following aspects of the suspended ceiling system and plywood lining installation:

- Design calculations - where required;
- Dimensioned plans of each suspended ceiling showing all essential elements and materials;
- Complete details of the installation construction, connections and all support systems;
- Details of all control joint types - where required;
- Plywood sheet layout, and details of plywood sheet joints and fixing;
- All building services associated with the suspended ceiling system - where required;
- Coordination requirements/issues with other works and trades - where required;
- A schedule of materials, finishes, componentry, fittings, fixings and fastenings.

3.8.2.4 Producer Statement (other manufacturer's system)

Producer Statement PS1 - where required. Where plywood interior linings are installed as a component of another manufacturer's proprietary system, the system manufacturer shall furnish a completed Producer Statement PS1 (Design) as confirmation that the specified proprietary system as designed and documented complies with the relevant clauses of the New Zealand Building Code. The PS1 Producer Statement shall not serve as a product warranty or guarantee of compliance.

3.8.3 Performance

3.8.3.1 Limitations

Plywood Interior Linings must NOT be:
- used in external situations, or
- exposed to water or be installed in situations where extended exposure to humidity above 90% RH can reasonably be expected, or
- exposed to temperatures in excess of 50°C for prolonged periods.

Except for specific engineering designed (SED) ceiling systems, plywood used for ceiling linings shall not exceed 17.5 kg/m².

3.8.3.2 Bracing Performance - Walls

Bracing Performance - Walls - Plywood Interior Linings. Where noted as 'Bracing' on the drawings, additionally comply with all relevant aspects of NZS 3604: Section 5, Bracing Design, according to the specific bracing demand, and as specified on the approved drawings and bracing schedule.

3.8.3.3 Ceiling Diaphragms

Plywood lined ceiling diaphragms shall comply with the requirements of NZS 3604: Section 13.5, and the minimum plywood panel size shall be no less than 1800mm x 900mm.

3.8.3.4 Grid Suspension Systems - Suspended Ceilings

Grid Suspension System - Suspended Ceilings. Specific Engineering Design (SED) required. Refer to separate specification section Suspended Ceilings.

The design of the specified grid suspension system for ultimate and serviceability limit states shall take into account the action effects arising from dead loads, live loads, wind loads, earthquake loads, and air pressure fluctuation, in accordance with the requirements of AS/NZS 2785, NZS 1170.5, the New Zealand Building Code, and the AWCI 'Code of Practice for Design, Installation and Seismic Restraint of Suspended Ceilings'.

3.8.4 Ceiling Lining - Standard Sheet

3.8.4.1 A Grade Face Veneer, Interior Plywood - Sanded

Plywood Ceiling Lining - Standard Sheet (non-perforated/non-grooved). Plywood sheet complying with AS/NZS 2270, and manufactured with an A-Grade rotary-cut face veneer, sanded smooth over the entire surface, and with solid square edges, as specified below. Suitable for interior wall and ceiling lining applications. Installed as a ceiling lining to the layout and details shown on the approved drawings, and as specified herein.

Manufacturer/Supplier:
Veneer Species:
Grade (front/back): A/-
Thickness & No. of Plies:
Sheet Dimensions:
Manufactured Standard:

Finish: Refer to Finishes & Coatings clause.
Installed Location:

3.8.5 Wall Lining - Standard Sheet

3.8.5.1 A Grade Face Veener, Interior Plywood - Sanded

Plywood Wall Lining - Standard Sheet (non-perforated/non-grooved). Plywood sheet complying with AS/NZS 2270, and manufactured with an A-Grade rotary-cut face veneer, sanded smooth over the entire surface, and with solid square edges, as specified below. Suitable for interior wall and ceiling lining applications. Installed as a wall lining to the layout and details shown on the approved drawings, and as specified herein.

Manufacturer/Supplier:
Veneer Species:
Grade (front/back): A/-
Thickness & No. of Plies:
Sheet Dimensions:
Manufactured Standard:
Finish: Refer to Finishes & Coatings clause.
Installed Location:

3.8.6 Components & Accessories

3.8.6.1 Timber Ceiling Battens

Timber Ceiling Battens. Except where specified or indicated otherwise, timber ceiling battens shall be 70 x 35mm thick, and installed to the layout and details shown on the approved drawings, and fixed in accordance with NZS 3604: Table 13.3. Refer to separate specification section Timber Framing.

3.8.6.2 Metal Ceiling Battens

Metal Ceiling Battens. GIB® Rondo® Metal Ceiling Batten System, or approved equivalent drywall metal ceiling batten system. Installed in accordance with the manufacturer's requirements to the layout and details shown on the approved drawings. Refer to separate specification GIB® Rondo® Metal Batten Systems or other.

3.8.6.3 Timber Wall Battens

Timber Wall Battens. Except where specified or indicated otherwise, timber wall battens shall be 70 x 35mm thick, installed to the layout and details shown on the approved drawings.

3.8.6.4 Metal Furring Channel Wall Battens

Metal Wall Battens. GIB® Rondo® Wall Strapping System, or approved equivalent drywall metal furring channel system. Installed in accordance with the manufacturer's requirements to the layout and details shown on the approved drawings. Refer to separate specification GIB® Rondo® Metal Batten Systems or other.

3.8.6.5 Concealed Fix Wall Panel Mounting System - Negative Joint

Concealed Fix Wall Panel Mounting System - Negative Joint. Proprietary, concealed fix, aluminium rail mounting system for plywood wall panels with negative-expressed joint detail, incorporating horizontal rails (wall-mounted carrier rail, panel-mounted panel rail), negative joint backing (horizontal, vertical), screw fasteners. Installed in accordance with the manufacturer's requirements and to the plywood wall panel installation layout and details shown on the approved drawings.

System Manufacturer/Brand:
Negative Joint Backing Finish & Colour:
Installed Location:

3.8.6.6 Plywood Fasteners

Plywood Fasteners. Fasteners for fixing plywood linings shall be selected and used according to best fixing practices and the manufacturer's/supplier's technical literature, and shall be appropriate for the lining application and performance, and to suit the supporting frame material. Fastener placement (frequency) shall be as specified herein and/or on the approved drawings.

3.8.6.7 Wallboard Adhesive

Wallboard Adhesive. Bostik Wallboard Gold, or the plywood manufacturer's approved equivalent flexible, high-strength, non-slump, wallboard adhesive. Used to adhere plywood interior linings, in accordance with the adhesive manufacturer's requirements.

3.8.6.8 Timber Finishing Trims

Timber Finishing Trims - as specified, dimensioned and detailed on the approved drawings.

3.8.7 Finishes & Coatings

3.8.7.1 Clear Finish (factory applied) - Ceiling, Standard Sheet

Plywood Ceiling Lining - Standard Sheet (non-perforated/non-grooved). The specified plywood ceiling lining panels shall be factory-finished with a clear coating, of the specified brand/type and gloss level. No subsequent site finishing or treatment is required. Refer to separate specification section Painting & Decorating.

When a specific plywood panel edge profile (not square) is required, the panel edges shall be profiled to the specific shape prior to coating.

Clear Coating Brand/Type:
Gloss Level:

3.8.7.2 Paint Finish (factory applied) - Ceiling, Standard Sheet

Plywood Ceiling Lining - Standard Sheet (non-perforated/non-grooved). The specified plywood ceiling lining panels shall be factory-coated with a solid-colour paint, of the specified brand/type, colour and gloss level. No subsequent site finishing or treatment is required. Refer to separate specification section Painting & Decorating.

When a specific plywood panel edge profile (not square) is required, the panel edges shall be profiled to the specific shape prior to coating.

Paint Brand/Type:
Colour:
Gloss Level:

3.8.7.3 Wood Stain Finish (factory applied) - Ceiling, Standard Sheet

Plywood Ceiling Lining - Standard Sheet (non-perforated/non-grooved). The specified plywood ceiling lining panels shall be factory-coated with an interior natural wood stain, of the specified brand/type and colour. No subsequent site finishing or treatment is required. Refer to separate specification section Painting & Decorating.

When a specific plywood panel edge profile (not square) is required, the panel edges shall be profiled to the specific shape prior to coating.

Paint Brand/Type:
Colour:

3.8.7.4 Clear Finish (factory applied) - Wall, Standard Sheet

Plywood Wall Lining - Standard Sheet (non-perforated/non-grooved). The specified plywood wall lining panels shall be factory-finished with a clear coating, of the specified brand/type and gloss level. No subsequent site finishing or treatment is required. Refer to separate specification section Painting & Decorating.

When a specific plywood panel edge profile (not square) is required, the panel edges shall be profiled to the specific shape prior to coating.

Clear Coating Brand/Type:
Gloss Level:

3.8.7.5 Paint Finish (factory applied) - Wall, Standard Sheet

Plywood Wall Lining - Standard Sheet (non-perforated/non-grooved). The specified plywood wall lining panels shall be factory-coated with a solid-colour paint, of the specified brand/type, colour and gloss level. No subsequent site finishing or treatment is required. Refer to separate specification section Painting & Decorating.

When a specific plywood panel edge profile (not square) is required, the panel edges shall be profiled to the specific shape prior to coating.

Paint Brand/Type:
Colour:
Gloss Level:

3.8.8 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades to install plywood interior linings as required, and to ensure that:
- appropriate tolerances and clearances allow for adjacent internal linings, fixtures, fittings, services, etc; and
- the linings correctly allow for proper door and window installation; and
- penetrations for building services are correctly handled to maintain sheet integrity and performance.

3.8.9 Workmanship

Where required by the NZ Building Act 2004, it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner. The building shall be completely enclosed and weathertight before plywood lining installation commences.

Installation of plywood interior linings shall be carried out by qualified and experienced tradespersons, familiar with the specified materials and installation techniques, in accordance with the manufacturer's technical literature, and to fully comply with all warranty requirements. Submit evidence of experience on request.

All cutting, fixing, jointing and finishing techniques shall be exactly as recommended by the manufacturer. All work shall be such as to leave a neat, efficient and robust installation, to the required standard and free from damage and defects.

3.8.10 Delivery & Handling

Inspect plywood sheets for damage and visual defects upon delivery; reject any damaged or defective sheets, and immediately contact the supplier for replacement. Do not use damaged or defective materials and products, or products that are beyond the designated shelf life.

Store plywood sheets indoors, in neat, flat stacks off the floor, in dry conditions and without any sagging or distortion, in accordance with the manufacturer's recommendations. Keep plywood linings and accessories dry, out of direct sunlight, and protected from damage, moisture and contamination at all times.

Plywood sheets must not be left wrapped in non-breathable material for longer than recommended by the plywood supplier/manufacturer.

Handle materials in accordance with the manufacturer's requirements and in a manner that prevents damage to or deterioration of the material.

Installers shall be familiar with and comply with the manufacturer's safe handling requirements and precautions for use, and shall use appropriate safety gear when handling materials.

Installers shall conform with all relevant WorkSafe NZ Guidelines and Codes of Practice - including the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

3.8.11 Preparation

3.8.11.1 General

All framing and substrates shall be complete and ready for plywood lining installation.

Timber framing shall comply with NZS 3604, or with NZS 3603 and AS/NZS 1170 for specific design, and have a maximum moisture content 18% at the time of plywood interior lining installation.

Light structural steel framing shall comply with the requirements of AS/NZS 4600 or the NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria. All light structural steel framing members shall satisfy the requirements of AS/NZS 1170. Comply with the steel framing fabricator's specifications and requirements for plywood lining installation.

Steel stud partitioning shall comply with AS 1397 and as specified and shown on the drawings. Comply with the manufacturer's specifications and requirements for plywood lining installation.

Concrete substrates shall comply with the CCANZ CP 01:2011 or with NZS 3109. New concrete must have aged for a minimum of 28 days. Ensure that concrete surfaces are within the tolerances specified. For of direct bonded plywood linings, concrete substrates must below 75% relative humidity prior to installation.

Concrete masonry substrates shall comply with NZS 4229, or with NZS 4230 and AS/NZS 1170 for specific design. For of direct bonded plywood linings, concrete masonry substrates must below 75% relative humidity prior to installation.

Carry out all necessary moisture readings. Do not commence installation until the moisture readings are below the required level.

Carry out all necessary substrate inspections and preparatory work in accordance with the plywood manufacturer's recommendations.

Check that the building envelope has been finished at all penetrations including doors, windows, services, etc., and the building is weathertight.

Check that all fixtures, fittings and built-in items are correctly installed, and that all framing and substrate edges are completed as detailed.

Check junctions to all other building elements and ensure that all necessary works have been completed, including cavity insulation.

Confirm the location and details of movement control joints, as indicated on the drawings, prior to installation.

Ensure all pre-wiring and service piping is installed and complete.

Check that any required cavity insulation has been installed correctly and its bulk thickness does not exceed the framing thickness.

Remove all debris and rubbish from framing voids prior to installing linings.

The commencement of work on each section/area shall be deemed to indicate full acceptance by the installer that all preparatory works by other trades is complete.

3.8.11.2 Framing Check

Framing - check all aspects of preparatory works, including but not limited to:
- Check that the framing is straight and true to line, and is plumb/level and correctly aligned.
- Check that the framing is within the required deviation tolerances given in the relevant standard (NZS 3604 or other).
- Check that vertical and horizontal framing members are at the spacings shown on the drawings, and that any required battens or furring channels are installed to the required layout.
- Check that the framing has no projections due to structural and bracing bracketry, etc. Ensure that framing brackets, plates, braces, hold-downs, etc., are correctly installed.

3.8.11.3 Work above Ceilings

Check that all building work, mechanical, plumbing, electrical, fire protection and other services installed above the ceiling are completed and independently supported by the building structure - not by the ceiling system.

3.8.11.4 Negative Joint Backing

Pre-paint framing, battens or backing situated behind any expressed negative joints Matt Black, or other specified colour, prior to installing plywood linings.

3.8.12 Installation

3.8.12.1 General

Install plywood interior linings to the locations, layout and details shown on the approved drawings.

Prior to installation, confirm:
- The specific installation, jointing, fixing details and requirements for the plywood linings - including plywood wall and ceiling bracing systems;
- The locations and construction details of all movement control joints within the plywood linings;
- The locations and details of building services and other fixtures and fittings penetrating the plywood linings;
- Any subsequent site-applied surface coating or finishing treatment for the plywood linings.

3.8.12.2 Ceiling Battens

Install ceiling battens to suit the plywood ceiling lining panel layout as shown on the drawings, and to ensure a uniform border and pattern distribution is achieved for perforated or grooved plywood.

Fix ceiling battens to joists or rafters at the spacings specified on the approved drawings - batten spacings shall not exceed those specified.

Ceiling battens shall all run in the same direction within the ceiling area or between movement control joints. In no case shall ceiling battens be continuous over movement control joints in the structure.

Make due allowance for the plywood lining thickness when establishing the finished batten datum level.

Except for T&G jointed plywood sheets and where specified otherwise, plywood ceiling lining panels shall be fully supported along all panel edges and joints by ceiling battens and nogs/dwangs/blocking - set at right angles to and flush with the battens.

Pre-paint ceiling battens and furring channels situated behind expressed negative joints Matt Black, or other specified colour, prior to installing plywood linings.

3.8.12.3 Ceiling Linings

Install plywood ceiling lining panels and panel trim to the layout and details shown on the approved drawings. Framing/battens behind expressed negative detail joints must be painted matt black (or other specified treatment) prior to plywood panel installation.

Except where detailed otherwise, plywood ceiling panels shall be parallel to wall lines, with panel joints straight and accurately aligned. Panel joints shall be as detailed on the drawings, and centred over supporting framing/batten.

Except where detailed otherwise, the panel surface between adjoining/adjacent panels shall be to the same surface plane, without abrupt variation across the joint.

Orientate plywood panels with the the face veneer grain facing the layout shown, and with site-cut edges hidden from view. Exposed site-cut edges shall be finished to match the factory-finished edges.

Decorative plywood panels of the same wood species and veneer grade shall be placed so that the face veneer colour and grain between adjacent panels is relatively uniform and non-contrasting and is within the permitted variation limit - any variation occurring shall be gradual and within the permitted limits.

Accurately form cut-outs for recessed luminaires, ceiling diffusers and grilles, sprinkler heads, and other cabled and piped and services fixtures and fittings that penetrate the ceiling lining, to the locations and layout shown on the drawings, with cut-outs correctly sized and to the required tolerances.

Fix plywood panels with the specified fasteners and specified spacings. All fasteners shall be uniformly spaced and accurately aligned.

Install all necessary finishing mouldings and trim as detailed to complete plywood joint and edge details.

3.8.12.4 Ceiling Diaphragms

Plywood lined ceiling diaphragms shall comply with the requirements of NZS 3604: Section 13.5, and the minimum plywood panel size shall be no less than 1800mm x 900mm.

Install ceiling diaphragm plywood lining panels and panel trim to the layout and details shown on the approved drawings; at right angles to ceiling battens; with sheet end-joints staggered 600mm or as dimensioned on the drawings; and with panel joints touch fitted and accurately aligned, straight and true to line.

Orientate plywood panels with the face veneer grain facing the layout shown, and with site-cut edges hidden from view. Exposed site-cut edges shall be finished to match the factory-finished edges.

Fix plywood panels to ceiling battens with the specified fasteners spaced at maximum 150mm centres around the diaphragm boundary and plywood sheet perimeter - 10mm from sheet edges - and at maximum 300mm centres to intermediate supports. All fasteners shall be uniformly spaced and accurately aligned.

Decorative plywood panels of the same wood species and veneer grade shall be placed so that the face veneer colour and grain between adjacent panels is relatively uniform and non-contrasting and is within the permitted variation limit - any variation occurring shall be gradual and within the permitted limits.

Accurately form cut-outs for recessed luminaires, ceiling diffusers and grilles, sprinkler heads, and other cabled and piped and services fixtures and fittings that penetrate the ceiling lining, to the locations and layout shown on the drawings, with cut-outs correctly sized and to the required tolerances.

Install all necessary finishing mouldings and trim as detailed to complete plywood joint and edge details.

3.8.12.5 Wall Linings

Install plywood wall lining panels and panel trim to the layout and details shown on the approved drawings. Framing/battens behind expressed negative detail joints must be painted matt black (or other specified treatment) prior to plywood panel installation.

Except where detailed otherwise, plywood wall panel joints (vertical/horizontal) and panel edges shall be true to plumb and level, straight and accurately aligned. Panel joints shall be as detailed on the drawings, and centred over the supporting frame/batten line.

Except where detailed otherwise, the panel surface between adjoining/adjacent panels shall be to the same surface plane, without abrupt variation across the joint.

Orientate decorative plywood panels with the face veneer grain facing the layout shown, and with site-cut edges hidden from view. Exposed site-cut edges shall be finished to match the factory-finished edges.

Decorative plywood panels of the same wood species and veneer grade shall be placed so that the face veneer colour and grain between adjacent panels is relatively uniform and non-contrasting and is within the permitted variation limit - any variation occurring shall be gradual and within the permitted limits.

Accurately form cut-outs for power outlets, controls, switches, and other cabled and piped services fixtures and fittings that penetrate the wall lining, to the locations and layout shown on the drawings, with cut-outs correctly sized and to the required tolerances.

Fix plywood panels to framing with the specified fasteners and specified spacings. All fasteners shall be uniformly spaced and accurately aligned.

Install all necessary finishing mouldings and trim as detailed to complete plywood panel joint and edge details.

3.8.12.6 Wall Linings - Concealed Fix Wall Panel Mounting System

Install the proprietary concealed fix wall panel mounting system and plywood panels in accordance with the manufacturer's requirements to the plywood panel layout and details shown on the approved drawings. Individual plywood panels shall be hung by the panel-mounted panel rails, and mounted to the wall-mounted carrier rails.

The plywood panels shall be concealed fixed, with the panel-mounting rails screw-fixed to the back of the plywood panels at the required set-out - according to the wall-mounted carrier rail set-out.

Except where detailed otherwise, plywood wall panel joints (vertical/horizontal) and panel edges shall be true to plumb and level, straight and accurately aligned. Panel joints shall be as detailed on the drawings.

Except where detailed otherwise, the panel surface between adjoining/adjacent panels shall be to the same surface plane, without abrupt variation across the joint.

Orientate decorative plywood panels with the face veneer grain facing the layout shown, and with site-cut edges hidden from view. Exposed site-cut edges shall be finished to match the factory-finished edges.

Decorative plywood panels of the same wood species and veneer grade shall be placed so that the face veneer colour and grain between adjacent panels is relatively uniform and non-contrasting and is within the permitted variation limit - any variation occurring shall be gradual and within the permitted limits.

Accurately form cut-outs for power outlets, controls, switches, and other cabled and piped services fixtures and fittings that penetrate the plywood panels, to the locations and layout shown on the drawings, with cut-outs correctly sized and to the required tolerances.

Install all necessary finishing mouldings and trim as detailed.

3.8.13 Completion

3.8.13.1 Completion

Visually inspect the plywood lining panels to ensure they have been installed to the required layout, and are correctly fixed, with all jointing and panel edges finished and accurately aligned, to the details shown on the drawings.

Check for any damage and surface marking and defective work - repair or replace as necessary to the required standard.

Leave all of this work complete and to the required standard, and in accordance with the associated warranty requirements.

As required, protect the completed installation from damage and contamination until hand-over as scheduled or directed.

Leave the installed linings clean and free of surface marking. Any cleaning of plywood panels shall be done with a damp cloth - do not use harsh, abrasive cleaners or solvents.

Leave adjacent surfaces and finished work clean and free of damage and contamination. Remove all associated rubbish from site.

Issue to the Owner a copy of the plywood manufacturer's maintenance requirements, and a copy of the manufacturer's product warranty.

3.8.13.2 Site-Applied Finishes

The preparation and painting/clear coating of installed plywood interior linings shall be carried out (by others) in accordance with AS/NZS 2311 and with the paint manufacturer's recommendations. Refer to separate specification section Painting & Decorating.

3.9 Workmanship & Materials

4 ALUMINIUM JOINERY

4.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

4.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1734:1997(AS/NZS)	Aluminium and aluminium alloys - Flat sheets, coiled sheet and plate
1866:1997(AS/NZS)	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
2208:1996(AS/NZS)	Safety glazing materials in buildings
4211:2008(NZS)	Specification for performance of windows
4223.1:2008(NZS)	Code of practice for glazing in buildings - Glass selection and glazing
4223.2:2016(NZS)	Glazing in buildings - Part 2: Insulating glass units
4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4223.4:2008(NZS)	Glazing in buildings - Part 4: Wind, dead, snow, and live actions
4667:2000(AS/NZS)	Quality requirements for cut-to-size and processed glass
4668:2000 (AS/NZS)	Glossary of terms used in the glass and glazing industry
AS/NZS 4666:2012	Insulating glass units

4.3 Aluminium Windows & Doors

4.3.1 Alternatives

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

Thermal performance (NZBC H1/AS1) must be as required to meet the Designer's Thermal Evaluation.

4.3.2 Installation Type

4.3.2.1 Timber Frame Installation - Direct Fix

All windows (and aluminium frame external doors) installation work shall be exactly in accordance with NZBC E2/AS1, the Windows Association's Windows Installation System (WANZ:WIS), and details on the drawings or supplied by the windows manufacturer.
Check framing alignment, and that window openings are square and the correct size for fitting tolerances.
Prepare framing openings by neatly cutting the building wrap at 45º into the corners, turning wrap

through the frame depth and fixing to the inside face, flashing the bottom corners with moulded plastic and over-flashing the full sill and 200mm up the jambs with the specified flexible flashing tape, stapled to hold the stretched external corners. At head corners install flashing tape 200mm each way from the corners.

Install the sill flashing, extending from an upstand lip behind the line of the aluminium frame out to lap a minimum of 35mm down over the top of the cladding, sloping at 15º unless the glazing weight requires the frame be blocked up for support. (If the flashing is level for blocking-up the sill, upstand its ends to create 'dams' as shown in E2/AS1).

Set shims or pack as necessary and install the frames exactly true and square. Use appropriate separators between aluminium and other materials, and fix securely with due regard for any anticipated movements and for linings, trim etc.

Install the head flashing, extending 35mm up behind the cladding (and in turn over-flashed with an additional piece of wrap cover extended up under the wrap or flashing or eaves above), sloping at 15º down to the exterior, and turning down to cover the top of the aluminium frame by at least 10mm, before finishing with a 5mm 45º 'kick out'. Seal between head flashing and cladding at the ends as detailed. Install jamb flashings/sealant or scribers as detailed.
After frames installation install closed cell backing rods as required and expanding foam air-seal the gap between framing and liners.

4.3.3 Interior Finish

4.3.4 Reveal

As per drawing.

4.3.5 Glass Platform

Single Glazed.

4.3.6 Finish

4.3.6.1 Powder Coated Aluminium - Matt

Polyester powder coating in accordance with WANZ Powder Coating Quality Assurance System and AAMA 2603-98 performance is required.

4.3.7 Hardware

Hardware colour matched to Aluminium Joinery.

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

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

4.3.8 Workmanship

These windows will be manufacturerd in workshops containing all mechanical equipment appropriate for the work, and by experienced and competent tradesmen who are familiar with the techniques and materials specified.

The manufacturer will co-ordinate with other trades to establish the exact sizes for all frames before fabrication. Frames and sashes will be fabricated true, square, rigid, and 'out of wind', with all joints strongly mechanically fixed, and with mitres tight and fully sealed. Potential thermal, wind and seismic movements will be accommodated within the construction. All cavities will drain to the exterior, and all drilling swarf etc. will be removed during fabrication.

Stays, hinges, running gear and glazing will be installed as scheduled (the Designer will be notified if any scheduled hardware of fixing position appears to be inappropriate for this project).

Hardware will be fixed true to line and position, and adjusted and oiled as required for correct operation.

Glass will be cut true and square, sized to provide correct edge clearances, blocked into place as required, and all units will be delivered either pressure fit, pocket glaze, or beaded/wedged, unless site glazing is required. Glazing gaskets will be compatible with all adjacent materials, and cut 1% over-length to absolutely avoid stretching during installation. Frames will be braced etc. as necessary for transportation to the site.

Flashings as detailed will be supplied. Flashing materials will be compatible with the windows.

4.3.9 Delivery and Installation

4.3.9.1 Delivery and Installation

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and the construction principles that are embodied in the Acceptable Solutions.

Arrange for delivery of windows to the site only when a suitable storage situation is available for them, handle the windows in accordance with the manufacturers requirements, avoid any frame distortion, avoid rubbing damage, avoid contact with concrete, plaster, mud etc. and keep them dry. Retain protective coverings for as long as possible, and remove them at completion.

Experienced and competent tradesmen who are familiar with the techniques and materials specified shall carry out all installation work. Fix in accordance with the manufacturer's instructions. Take utmost care to avoid damage to anodized or powder coated surfaces - correction of any such disfigurement requires written authority - replace any badly damaged items.

Use fixings compatible with the materials involved, as recommended by the windows manufacturer and to comply with the DWP requirements, basically aluminium or Type 316 stainless steel where exposed externally; galvanized to AS/NZS 4680, 610g/m2, may be used where not exposed.

Thoroughly check all preparatory work to openings prior to installation, including underlay, corner seal tapes, adjacent cladding, pre-installed flashings, waterproofing systems etc. as appropriate. Use inert barriers or coatings to prevent contact between dissimilar metals or between aluminium and concrete.

Install flashings as detailed and supplied by the windows manufacturer, installed tightly and neatly with absolute minimum tolerances, with head weathering jamb, jamb weathering sill, and sill open (draining) to exterior. Except where the window is recessed all head flashings shall extend 30mm minimum beyond the frame.

Air-seal all frame perimeters to adjacent structure to a depth of 15 - 20mm with expanding foam or appropriate sealant including a PEF rod at head, sill and jambs to retard the spread of sealant.

Weather-seal frame jambs etc. to adjacent surfaces (or to each other) as detailed or as required by the windows manufacturer, to achieve a fully watertight installation. In preparation for sealant the joints shall be clean, dry, and primed if necessary. Insert closed cell polyethylene backer rods or a polyethylene tape slip layer if required. Mask adjacent surfaces if appropriate, install the sealant fully in accordance with the sealant manufacturer's recommendations, and finish to even smooth surfaces.

Remove trade debris progressively, appropriately clean any affected adjacent surfaces, thoroughly clean the windows, check that all hardware is in full working order, and provide safety indication of the glass for the balance of adjacent works.

5 G L A Z I N G

5.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

5.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1170.0:2002(AS/NZS)	Structural design actions - Part 0: General principles
2208:1996(AS/NZS)	Safety glazing materials in buildings
3604:2011(NZS)	Timber-framed buildings
4211:2008(NZS)	Specification for performance of windows
4223.1:2008(NZS)	Code of practice for glazing in buildings - Glass selection and glazing
4223.2:2016(NZS)	Glazing in buildings - Part 2: Insulating glass units
4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4223.4:2008(NZS)	Glazing in buildings - Part 4: Wind, dead, snow, and live actions
4232.2:1988(NZS)	Performance criteria for fire resisting enclosures - Part 2: Fire resisting glazing systems
4667:2000(AS/NZS)	Quality requirements for cut-to-size and processed glass
4668:2000 (AS/NZS)	Glossary of terms used in the glass and glazing industry
AS/NZS 4666:2012	Insulating glass units

5.3 Non-Structural Glazing

5.3.1 Scope

Supply and install the selected glass products to the windows, doors, curtain wall systems, roofs and canopies, balustrades and barriers, partitions and screens, and other non-structural glazing elements, as noted and shown on the drawings. All aspects of this work shall be in accordance with the glass manufacturer's installation requirements and recommendations, other relevant product manufacturers' recommendations, and as shown on the drawings.

5.3.2 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.

Coordinate with other trades for all necessary holes and cut-outs, etc., for glass-mounted hardware, fittings and fixtures, and to install all glass and glazed elements as required.

5.3.3 Workmanship

All installation work shall be carried out by experienced and competent tradesmen familiar with the products specified and installation techniques, to the manufacturer's requirements and recommendations, and the requirements of the relevant Glazing Standards, and to the layout and details shown on the drawings.
Handle and store glass in accordance with the manufacturer's recommendations.
Provide temporary safety markings to all glass panes as the installation work progresses.
Finish all external glazing wind and watertight.
Do not use damaged, marked or faulty materials.

5.3.4 Glass Type

5.3.4.1 Clear Float Glass

Glass as per drawings, annealed float glass, complying with AS/NZS 4667 and in accordance with NZS 4223.1. Installed to the locations identified on the drawings and schedules.

Manufacturer, brand name & type:

5.3.4.2 Toughened Safety Glass

Toughened Safety Glass. Toughened Grade 'A' Safety Glass, complying with AS/NZS 2208 and AS/NZS 4667 and in accordance NZS 4223.1. Installed to the locations identified on the drawings and schedules. All cutting and drilling and other processing requirements must be done prior to toughening.

Manufacturer, brand name & type:

5.3.5 Components & Accessories

5.3.5.1 Aluminium Framed Glazing

Provide all necessary glazing components and accessories including glazing tape, setting and distance blocks, sealants, gaskets, etc., to complete aluminium framed glazing as required.

5.3.5.2 Steel Framed Glazing

Provide all necessary glazing components and accessories including glazing tape, setting and distance blocks, sealants, gaskets, etc., to complete steel framed glazing as required.

5.3.6 Installation

5.3.6.1 Aluminium, Single Glazed

Install glass panes into aluminium frames in accordance with the glazing manufacturer's recommendations and NZS 4223.1, and as detailed.

5.3.6.2 Steel, Double Glazed (IGU's)

Ensure all glazing rebates and beads are correctly sized and prepared in accordance with the glazing manufacturer's requirements. Neatly install Insulating Glass Units in accordance with the glazing manufacturer's requirements and as detailed on the drawings.

5.3.7 Manifestations

Manifestations shall be in accordance with NZS 4223 and as shown on the drawings, and applied to the manufacturer's requirements.

Manufacturer, brand name & type:

5.3.8 Completion

Check that all glass has been installed correctly to the required standard and as shown on the drawings. Check for damage and surface marking and replace as necessary. Clean off and remove all temporary safety markings, as programmed and when instructed, and leave glass trade clean.
Remove all rubbish and waste material from site.
Issue to the Owner a copy of the Glass Manufacturer's maintenance requirements and all necessary Manufacturer Warranties.

6 TILING

6.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

6.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

6.3 Mapei Tiling Systems

6.3.1 Scope

6.3.1.1 Scope

Supply and install the specified Tiling Systems from Mapei as accessories of the Tiling works identified on the drawings. All aspects of this work shall be in complete accordance with Mapei product technical literature (check www.mapei.co.nz, or call 09 921 1994 for the latest editions), other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Tiling Systems from Mapei.

6.3.2 Interior Dry-Area Wall Tile Adhesive

6.3.2.1 Adeflex R

Mapei Adeflex R. A premium grade, deformable, rubber-modified, cement-based adhesive for bonding ceramic tiles and stone material.

Classification:
- Adeflex R is a normal (1), cementitious (C) adhesive, classified as C1.
- Adeflex R is a deformable adhesive classified as S1.
- Adeflex R mixed with Isolastic 50 is a highly deformable adhesive classified as S2.

Where to use:
- For interior floor and wall installations, suitable for most ceramic tile types, mosaics, porcelain, natural stone, fully vitrified and quarry tiles, over most traditional, well prepared substrates including fully cured concrete and render, plasterboard and fibre cement sheeting.

Application examples:
Bonding ceramic tiles and mosaics on the following substrates:
- for gypsum substrates and anhydrite screeds, provided they are dry and have been treated with a coat of Primer G;
- conventional concrete slabs or suspended concrete slabs provided they are completely cured and stable;

- conventional renders and cement mortar walls;
- plasterboard and fibre cement sheeting that is pre-primed and installed for tiling purposes;
- timber floors provided that fibre cement ceramic tile underlay has been installed prior to tiling;
- rigid plywood or structural particleboard substrates if mixed with Isolastic 50;
- suitable for use over Mapei and/or Mapei-approved waterproofing membranes when mixed with Isolastic 50.

Technical characteristics:
- Adeflex R is an off-white powder composed of cement, special fillers based on recycled materials synthetic resins and special additives.
- Adeflex R is a cementitious, deformable adhesive of Class C1S1 when mixed with water.
- The adhesion strength and deformability of Adeflex R can be improved by mixing it with Isolastic 50 or Isolastic diluted 1:1 with water, resulting in an adhesive of Class C2S2 (improved and highly deformable).

Recommendations:
- not suitable for external use.

Preparing the mix:
Use 5.6-6.4 litres of clean water or 6.6-7 kg of Isolastic 50 for every 20 kg bag of Adeflex R. Mixed this way, Adeflex R remains workable for at least 8 hours.

Applying the mix:
- Apply Adeflex R on to the substrate using a notched trowel with sufficient depth to ensure a coverage as recommended by the current Australian Standards or better.
- To maximise adhesion, spread a thin layer of Adeflex R is on to the substrate using the flat side of the trowel. Immediately thereafter build up the thickness required using the notched side of the trowel.
- In the case of floors subject to heavy traffic and point loads, Adeflex R should also be spread on to the back of the tile (back-buttering method), in order to ensure complete coverage.

Application data (at +23°C and 50% RH):
- Mixing ratio with water: 100 parts Adeflex R with 28-32 parts water by weight.
- Mixing ratio with Isolastic 50: 100 parts Adeflex R with 33-35 parts Isolastic 50 by weight.
- Application temperature range: from +5°C to +35°C.
- Pot life: >8 hours.
- Open time: 20 minutes.
- Ready for grouting on walls: 4-8 hours depending on the absorbency of the back of the tiles.
- Ready for grouting on floors: after 24 hours depending on the absorbency of the back of the tiles.
- Set to light foot traffic: 24 hours.
- Ready for service use: 14 days.
- Colour: off-white.

Apply Adeflex R to properly prepared substrates in strict accordance with the manufacturer's requirements.

6.3.3 Interior Dry-Area Floor Tile Grout

6.3.3.1 Kerapoxy

Mapei Kerapoxy. A two-component acid-resistant epoxy grout (available in 23 colours) for joints of at least 3mm. Can also be used as an adhesive.

Where to use:
- Indoor and outdoor grouting of ceramic tile and natural stone floors and walls.
- Suitable for acid-resistant bonding and rapid setting of ceramic tiles, stone materials, fibre-cement, concrete and any other building material on all types of substrates normally used in construction.

Application examples:
- Grouting floors and walls in the food industry (dairies, abattoirs, breweries, wine-cellars, conserved-food plants, etc.), shops and areas where hygiene is required (ice-cream shops, butchers, fish vendors, etc.).
- Grouting industrial floors and walls (electrical industries, tanneries, battery rooms, paper-mills, etc.), where high mechanical resistance and resistance to acid attack is required.
- Grouting swimming pools; particularly suitable for basins containing salt or thermal water.
- Grouting ceramic tiles on laboratory benches, kitchen work surfaces, etc.
- Acid-resistant bonding of tiles (used as an adhesive in compliance with class R2T specification according to EN 12004 standard).
- Bonding marble doorsteps and window- sills.
- Bonding tiles in plastic reinforced by fibre glass swimming pools.
- Bonding special pieces of tiles.

Technical characteristics:
- Kerapoxy is a two-component, very low emission of volatile organic compounds, epoxy-resin-based product with silica sand and special components, with excellent resistance to acids and excellent cleanability.

Application procedure:
- The joints must be dry, clean, free of dust and emptied at least 2/3 of the tile thickness.
- The excess adhesive or mortar should be removed while still fresh.
- Before grouting, make sure that the installation mortar or the adhesive has set and released most of its moisture.

Application data (at +23°C and 50% RH):
- Mixing ratio: A + B = 9:1.
- Application temperature range: from +12°C to +30°C.
- Pot life: 45 minutes.
- Set to light foot traffic: 24 hours.
- Ready for service use: 4 days.
- Colours: 23 colours available.

Use Kerapoxy in strict accordance with the manufacturer's requirements.

Colour:

6.3.4 Warranty

6.3.4.1 Product Warranty

Mapei New Zealand Ltd Product Warranty Terms:

Mapei New Zealand Ltd (Mapei NZ Ltd) provides product warranties, if the products are installed in accordance with the products Technical Data Sheet (TDS) plans, specifications, and complies with the relevant provisions of the New Zealand building code.

Mapei NZ Ltd warrants that the product/s when prepared and applied in accordance with the TDS will have the properties and characteristics set out in the TDS and will retain these properties and characteristics for the duration of a warranty period.

A Person or Company applying the Mapei product (the Applicator) is not an agent or employee of Mapei NZ Ltd and therefore Mapei NZ Ltd takes no responsibility and assumes no liability for their workmanship.

Mapei NZ Ltd warranties do not cover installation, workmanship or product mixing and preparation aspects which is the responsibility of the Applicator.

Information relating to the application and use of Mapei products is given in good faith based on Mapei's current knowledge and experience of its products when they are appropriately stored, handled and applied under recommended conditions according to the information in the product/s TDS.

A full list of all product warranty terms and conditions is available upon request.

6.3.5 Workmanship

Installation work, including preparation and finishing, of the specified Mapei product(s), shall be carried out to best trade practice by experienced and competent tradespersons, familiar with the specified products and installation techniques, to fully comply with all Mapei warranty requirements, in accordance with the manufacturer's requirements, AS 3958.1, relevant Mapei BRANZ Appraisals, and as shown on the drawings. All work shall be such as to leave a neat, efficient, robust and waterproof installation.

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades to install tiling to the required set-out as necessary.

Application of the specified product(s) shall not be undertaken when the ambient temperature is outside the manufacturer's permissible temperature range. Exterior applications shall not be undertaken during inclement weather. As necessary, protect completed exterior work from rain and from hot dry winds and direct sunlight to aid proper curing.

Protect adjacent finished work and surfaces from damage and contamination during installation. Leave completed tiled surfaces clean, sound, and free of damage and marking of any kind.

6.3.6 Storage & Handling

Store Mapei products inside, in a weatherproof environment, clear of the floor, on a flat, even and level surface. Keep Mapei products dry, out of direct sunlight and protected from damage, moisture and contamination at all times.

Do not use damaged, defective or contaminated products, or products that are beyond their designated shelf life.

Handle all Mapei products in accordance with the manufacturer's requirements as set out in the relevant Technical Data Sheet(s) and in a manner that prevents contamination or deterioration of the material or reduces its performance.

Installers shall be familiar with and comply with the manufacturer's Safety Data Sheet precautions for use, and use appropriate safety gear when handling materials.

6.3.7 Preparation

6.3.7.1 General

Substrates shall be structurally sound, rigid, clean and dry, and free from dirt, dust, grease, oil, wax, paint residue, loose plaster and laitance, curing compounds and other materials and contaminants likely to affect the bonding and performance of the specified tile adhesives and grouts.

Carry out all necessary preparatory work to all substrates in accordance with the relevant product's Technical Data Sheet prior to its application.

Check that the substrate is free of voids and depressions, and is in correct alignment - true to line, level and/or plumb and to the falls indicated on the drawings.

Check that all embedded items are correctly installed, and that all surface edges are completed as detailed.

Confirm the location of movement control joints prior to commencement of the works, and ensure that they are appropriately trimmed - do not cover or bridge control joints with tiles, adhesive and grout.

Allow self-levelling underlayments and mortar screeds to properly cure in accordance with the manufacturer's recommendations before commencing tiling.

Ensure that the back of each tile is clean and free from dust or other contaminants prior to laying.

The commencement of work on each section of tiling shall be deemed to indicate full acceptance by the Tiling Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

6.3.7.2 Concrete Slabs

Insitu Concrete Slabs - check all aspects of preparatory works, including, but not limited to:
- Check that the concrete slab has been formed and finished to the levels and falls indicated on the drawings, including any tanking or waterproofing requirements.
- Concrete slab surface finishes must be compliant with NZS 3114 'U3 Surface Finish' or a light broom finish.
- New concrete must have aged for a minimum of 28 days prior to tiling.
- Old concrete must be thoroughly cleaned and washed and allowed to dry.
- Grind off any high spots, and using a proprietary levelling compound repair flush with feathered edges any low spots or damaged areas then grind smooth.
- Lightly grind any surface that is glazed to the extent that may compromise adhesive bonding.
- Leave the surface clean and free of dust and contaminants etc.
- Check that any protruding or exposed bare metal has been treated with a suitable corrosion-inhibiting primer.

6.3.7.3 Cement Screeds & Renders

Cement Screeds and Renders - check all aspects of preparatory works, including, but not limited to:
- Check that screeds and/or renders have been formed and finished to the levels and falls indicated on the drawings, including any tanking or waterproofing requirements.
- Screeds and/or renders must conform with the appropriate standard and should be finished a wooden float and left to cure for at least 24 hours for every 25mm of thickness.
- Check that the substrate is dry.
- Check that screeds have been laid to the levels and falls indicated on the drawings.
- Remove any excess mortar, loose material and surface projections.
- Check junctions with all other substrates and elements, ensuring that all necessary works have been completed as detailed.

6.3.7.4 Plasterboard Lining

Plasterboard Lining - check all aspects of preparatory works, including, but not limited to:
- Check that the plasterboard sheets have been correctly installed in accordance with the manufacturer's requirements, and that all sheet edges are fully supported.
- Check that all sheet joints and fastening heads are flush-filled with a suitable stopping compound.
- Check junctions with all other substrates and elements, ensuring that all necessary works have been completed as detailed.
- Check that all apertures, openings, edges and expansion and movement control joints are completed as detailed.

6.3.8 Application

6.3.8.1 Control Joints

Control joints in the substrate shall be extended through the tiling, and installed and completed to the layout and details shown on the drawings. Do not cover or bridge control joints with tiles, adhesive or grout. Confirm the location of all control joints before commencing installation.

6.3.8.2 Adeflex R

Adeflex R Tile Adhesive. Mechanically mix Adeflex R at the required ratio with clean water to a smooth, lump-free paste in accordance with the manufacturer's requirements. Do not mix more than can be used within 20 minutes. Ensue to follow the recommended setting and curing periods.

Apply Adeflex R tile adhesive evenly with a notched trowel to properly prepared substrates. Do not apply more adhesive than can be tiled over before the adhesive skins. Do not over-spread the adhesive, and avoid surface skinning - particularly when used in unfavourable conditions such as direct sunlight, wind and/or high temperatures.
Lay tiles into adhesive before surface skinning to achieve maximum contact and bonding. Do not apply water to skinned adhesive - re-trowel any adhesive that has skinned.

Remove excess adhesive from the tile joints as each tile is laid to ensure full depth grouting is achieved, and leave the tiled surface completely clean.

Protect tiled surfaces from exposure to moisture for at least 24 hours, and from frost and strong sunlight for at least 5-7 days after laying.

Grout tiles with the specified Mapei grout in accordance with the manufacturer's recommendations.

6.3.8.3 Kerapoxy

Kerapoxy Tile Grout. Mechanically mix Kerapoxy parts A and B at the required ratio to a smooth, lump-free paste in accordance with the manufacturer's requirements. Do not mix more than can be used within 45 minutes. Ensue to follow the recommended drying and curing periods.

Prior to application, ensure that the tile adhesive has completely set, and that the tile joints are clean, dry and free from excess adhesive and any foreign material. Rake out any excess adhesive from joints to ensure a maximum, uniform grout joint is achieved. Tile spacers must be removed prior to grouting.

Apply Kerapoxy grout evenly with a rubber squeegee or grouting float, ensuring that the tile joints are completely filled and smoothed to a dense, neat and uniform surface. Remove excess grout immediately - do not apply more material than can be completed within the designated open time.
Thoroughly clean the tiles immediately after grouting with a wet sponge or abrasive pad, making sure not to wash-out the joints.
Remove all grout residue from the surface of tiles with a sponge and clean water before the grout dries.

Protect grouted tiles from exposure to moisture for at least 24 hours after grouting, and from traffic and service in accordance with the manufacturer's recommendations.

7 JOINERY

7.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

7.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1491:1996(AS/NZS)	Finger jointed structural timber
2208:1996(AS/NZS)	Safety glazing materials in buildings
2924.1:1998(AS/NZS)	High pressure decorative laminates - Sheets made from thermosetting resins - Classification and specifications
3602:2003(NZS)	Timber and wood-based products for use in building
3610:1979(NZS)	Specification for profiles of mouldings and joinery
3619:1979(NZS)	Specification for timber windows
3631:1988(NZS)	New Zealand timber grading rules
4121:2001(NZS)	Design for access and mobility: Buildings and associated facilities
4211:2008(NZS)	Specification for performance of windows
4223.1:2008(NZS)	Code of practice for glazing in buildings - Glass selection and glazing
4223.2:2016(NZS)	Glazing in buildings - Part 2: Insulating glass units
4223.3:2016(NZS)	Glazing in buildings - Part 3: Human impact safety requirements
4223.4:2008(NZS)	Glazing in buildings - Part 4: Wind, dead, snow, and live actions
4666:2012(AS/NZS)	Insulating glass units
4667:2000(AS/NZS)	Quality requirements for cut-to-size and processed glass
NZBC D1	Access Routes

7.3 Timber Windows & Doors

7.3.1 Scope

Supply, install and commission Timber Windows and/or Doors, as specified and identified on the drawings and schedules, to the locations, layout and details shown on the drawings, complete with all components and accessories for proper installation, operation and performance. All aspects of this work shall be carried out to comply with the requirements of the New Zealand Building Code, relevant Standards, and in accordance with any specific manufacturer's requirements, other relevant product manufacturers' recommendations, and as noted and detailed on the drawings.

7.3.2 Interior Doors & Frames

7.3.2.1 Flush Solid Core Doors - MDF Facing

Flush Solid Core Interior Doors. MDF faced, and clashed two edges. Paint quality, factory pre-primed - to suit the specified finish and in accordance with AS/NZS 2311. Manufactured to the dimensions shown on the drawings and door schedule - including any formed vision panel and/or panel groove design detail.
Installed complete with door frame, hardware, acoustic seals, furniture and fittings, and any glazing, to the required handing and operation and locations shown on the drawings.

Manufacturer, brand name & style:
Location:

7.3.2.2 Door Frame - Rebated Solid Jamb

Rebated Interior Door Jamb. Solid timber, rebated, square profile door jamb, with 10mm deep stop and undershot or square edges, in accordance with NZS 3610 or as shown on the drawings. Paint (factory pre-primed) or stain quality - to suit the specified finish and in accordance with AS/NZS 2311. Manufactured to suit the overall wall construction thickness as shown on the drawings and finished with planted architraves both sides.

7.3.3 Interior Cavity Sliding Door Units

7.3.3.1 Flush Solid Core Door, MDF Facing

Interior Cavity Sliding Doors shall be flush solid-core, MDF faced, and clashed two edges. Paint quality, factory pre-primed - to suit the specified finish and in accordance with AS/NZS 2311. Manufactured and pre-assembled to the dimensions and design styles shown on the drawings and door schedule - including any formed vision panel and/or panel groove design detail.
Interior cavity sliding door units installed and commissioned to the required operation and performance in accordance with the manufacturer's requirements to the location and details shown on the drawings, complete with installation frame, sliding track, hardware, acoustic seals, furniture and fittings, and any glazing.

Cavity sliding door unit manufacturer and model:
Wall cavity/frame thickness:
Maximum kg load per door leaf:
Location:

7.3.4 Timber Quality

Timber for all solid timber windows and doors shall be in accordance with the requirements NZS 3602 and NZS 3631 and be equal to or better than Premium Grade and/or Select A Grade. Heart quality timbers shall comprise 100% heartwood. Items fabricated from timber which in the opinion of the Architect/Designer is deemed substandard shall be removed from the site and replaced.
Exterior timber shall be seasoned to a stable moisture content of 14-18%. Interior timber shall be seasoned to the stable moisture content (8-12% for air-conditioned or centrally heated, or 10-14% for heated, or 12-16% for unheated buildings) suitable for its location in the finished work.
If the use of inadequately seasoned timber results in winding, warping, twisting or shrinkage opening

of joints in the finished work the item shall be replaced by the manufacturer. Installation of interior doors is permitted only when the building is closed-in and weathertight.

7.3.5 Finish

Flush Solid Core Interior Doors to be Paint Finished; refer to Painting for specification requirements, materials, products and coatings. Any factory priming undertaken by the timber door manufacturer shall be carried out in strict accordance with the requirements of Painting specification.

Interior Door Frames to be Paint Finished; refer to Painting for specification requirements, materials, products and coatings. Any factory priming undertaken by the timber door manufacturer shall be carried out in strict accordance with the requirements of Painting specification.

7.3.6 Sliding Track System

Top Rolling Sliding Door Track System for Interior Doors. Installed in accordance with the manufacturer's requirements to the locations and details shown on the drawings and as noted on the door schedule.

Manufacturer, brand and model:
Maximum kg load per door leaf:
Track type, material & finish:
Wheel assembly type:
Location:

7.3.7 Hardware

Use only fixings and fastenings that are compatible with the materials involved, and that are appropriate for the assembly and installation of the components and suitable for the installed location and environment. Unless noted otherwise on the drawings and schedules, fixings and fastenings shall be Grade 316 stainless steel where they are exposed to weather, and hot dip galvanized steel where they are not exposed to weather. Unless noted otherwise; punch nail fixings and countersink screw fixings below the timber surface for filling and finish application.

Interior Door Hinges. 3 hinges per door leaf, unless noted otherwise. Hinge size and gauge sufficient to carry the door size and weight when hung and appropriate for the door operation, function and environment. Hinge screw fixings material-matched with hinges.

Hinge type: As per Drawings
Size: As per Drawings
Material & finish: As per Drawings

Refer to separate Hardware section and hardware schedule for window and door furniture specification requirements and product details. Window and door furniture shall be installed in accordance with the manufacturer's requirements to the locations shown on the drawings and schedules.

7.3.8 Glass

7.3.8.1 Toughened Safety Glass

Toughened Safety Glass. Toughened Grade 'A' Safety Glass, complying with AS/NZS 2208 and AS/NZS 4667 and in accordance NZS 4223.1 All cutting and drilling and other processing requirements shall be done prior to toughening. Installed to glazed timber windows and doors as indicated on the drawings and window and door schedules.

Manufacturer, brand name & type:
Location:

7.3.9 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades as required to install Timber Windows and Doors and accessories and hardware to the required operating performance and functionality and tolerances.
Where required, complete and submit for fabrication the manufacturer's Site Measure document confirming all window and/or door opening site-measurements, fixing types, and other necessary information prior to manufacture.

7.3.10 Workmanship

Where required by the NZ Building Act 2004 it is the building contractor's responsibility to ensure that all restricted building work is carried out by a Licensed Building Practitioner.

All installation and commissioning work shall be carried out by experienced and competent installers, familiar with the specified products and installation techniques, in accordance with the manufacturer's installation requirements and as shown on the drawings. All work shall be such as to leave a neat, efficient and robust installation. Do not install damaged or defective products, components and accessories.

Electrical wiring (by others) shall be carried out by a qualified electrician in accordance with the electrical standards and regulations. The Electrician shall connect the power supply, set the limits and commission the door. The Door Installer shall verify the operation of the door.

7.3.11 Delivery & Handling

Arrange for delivery of windows and doors to the site only when a suitable storage situation is available for them. Store timber windows, doors, frames and accessories undercover on a flat, level surface off the floor on bearers at the appropriate spacings. Keep door and window elements dry and protect from damage, moisture and contamination while stored. Retain any factory-applied protective coverings while stored.
Handle window and door joinery in a manner that prevents any marking, distortion, glass breakage or other damage.

7.3.12 Preparation

Timber Framed Walls, ensure that all preparatory work has been completed before installing joinery elements. Check all aspects of preparatory works to window and door openings, including but not limited to:
Check that the timber wall framing complies with NZS 3604, or is in accordance with NZS 3603 and AS/NZS 1170 for specific design, and with the drawings.
Check that all framed internal and external window openings and door openings are correctly sized for fitting tolerances, are square and correctly aligned, and that trimming members are plumb and level and true to line and plane.
Check that the specified building underlay and/or rigid air barriers have been installed in accordance with NZBC requirements and the manufacturer's recommendations, and all finishing tapes, flashings etc. at window and door openings.
Check that flexible sill tape at window openings is installed over the wall underlay, is flush with the inside of the framing and dressed up each end of the opening minimum 100mm, and that the front edge of the tape is folded and lapped minimum 50mm over the outside face of the framing and underlay.
Check that flexible flashing tape has been installed to the corners of window and door heads minimum 100mm each way from the corner junction, is flush with the inside line of the framing and is folded minimum 50mm over the outside face of the framing and wall overlay.
Check that all preparatory materials are lapped such that any water will run down to the exterior.
Check that any rigid air barrier to unlined gables and external garage walls is installed with an absorbent flexible underlay in accordance with E2/AS1 Table 23 and the manufacturer's recommendations.
Check window and door openings adjoining other building elements to ensure that all necessary works have been completed that will enable the windows and/or doors and accessories to be installed correctly.
Check that concrete slabs are correctly rebated to accommodate exterior timber door sills and any floor mounted timber window frames as detailed on the drawings, and that any required waterproofing membrane has been applied to the rebates.

Steel Framed Walls, ensure that all preparatory work has been completed before installing joinery elements. Check all aspects of preparatory works to window and door openings, including but not limited to:
Check that steel framing has been completed as shown on the drawings and inspected and approved by the BCA, and complies with NASH3405, or the NZBC for specific design.
Check that all framed internal and external window openings and door openings are correctly sized for fitting tolerances, are square and correctly aligned, and that trimming members are plumb and level and true to line and plane.
Check that the specified building underlay and/or rigid air barriers have been installed in accordance with NZBC requirements and the manufacturer's recommendations, and all finishing tapes, flashings etc. at window and door openings.
Check that flexible sill tape at window openings is installed over the wall underlay, is flush with the inside of the framing and dressed up each end of the opening minimum 100mm, and that the front edge of the tape is folded and lapped minimum 50mm over the outside face of the framing and underlay.

Check that flexible flashing tape has been installed to the corners of window and door heads minimum 100mm each way from the corner junction, is flush with the inside line of the framing and is folded minimum 50mm over the outside face of the framing and wall overlay.
Check that all preparatory materials are lapped such that any water will run down to the exterior.
Check that any rigid air barrier to unlined gables and external garage walls is installed with an absorbent flexible underlay in accordance with E2/AS1 Table 23 and the manufacturer's recommendations.
Check window and door openings adjoining other building elements to ensure that all necessary works have been completed that will enable the windows and/or doors and accessories to be installed correctly.
Check that concrete slabs are correctly rebated to accommodate exterior timber door sills and any floor mounted timber window frames as detailed on the drawings, and that any required waterproofing membrane has been applied to the rebates.

7.3.13 Installation

Install the specified interior cavity sliding door units in accordance with the manufacturer's requirements and as shown on the drawings.

Install all window and door hardware and furniture as scheduled and shown on the drawings to the required operation and functionality. Hardware will be fixed true to line and position, and adjusted and oiled as required for correct operation.

Ensure all metal and timber glazing rebates and beads are clean and dry, and have been primed or sealed to the glazing manufacturer's requirements. Glazing beads to be precut with tight closed joints. Self-adhering glazing tape or sealant neatly applied to rebates and jointed at corners. Setting blocks sized to maintain a uniform gap all round glass edge, and glass panes firmly set into frames against the glazing tape or sealant. Timber glazing beads neatly fitted against the glass and, firmly set and fixed to the frame straight and parallel as detailed on the drawings to prevent any movement.

Commission opening window sashes, doors, sliding carriage assemblies, and moving components to the required operation, performance and tolerances, and ensure that all hardware is in full working order. Provide safety indication of the glass for the balance of adjacent works.

7.3.14 Completion

Check that the timber windows and doors have been installed correctly and that all opening window sashes, doors, sliding carriage assemblies, and moving components are functioning to the required operation, performance and tolerances, and that all hardware is in full working order.
Check for defects, damage and glass breakage and repair/replace as necessary.
Leave the completed installation weathertight. Remove all rubbish and excess material from site.

Issue to the Owner a copy of any manufacturer specific maintenance requirements and any manufacturer specific Product Warranty and Installer Warranty for the installed timber windows and doors, components and accessories.

Where necessary, provide all Producer Statements.

7.4 Elements

7.4.1 Doors

All aspects of exterior and interior doors are specified and noted on the schedules.

7.4.2 Cabinets

Site check overall dimensions as appropriate. All details as per Project Design Drawings

8 PAINTING & DECORATING

8.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

8.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2310:2002(AS/NZS)	Glossary of paint and painting terms
2311:2017(AS/NZS)	Guide to the painting of buildings
2312.1:2014(AS/NZS)	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 1: Paint coatings
3750.0:2008(AS/NZS)	Paints for steel structures - Introduction and list of Standards

8.3 Dulux Painting Interior

8.3.1 Requirements

This schedule of specified Dulux coating systems must be read in conjunction with the 'Dulux Painting General' section of the Painting specification, of which all clauses and requirements shall be binding.

8.3.2 Plasterboard Ceilings - New

Interior Paperfaced Plasterboard New - Ceilings - Superior Finish (L5) - Ultra Low VOC Paint - Flat. Best Environmental System.
Gloss Level: Flat.
Coating Type: Water based.
System: DuSpec NZ_SD09009.
Fire Rating: Group Number 1-S; Report Number 5054; NZBC C/VM2 A1.5.
1st Coat: DULUX Professional Ultra 5 Surfacer, Prep & Finish @ 3m²/L.
2nd Coat: DULUX Professional Enviro2 Ceiling Flat @ 16m²/L.
3rd Coat: DULUX Professional Enviro2 Ceiling Flat @ 16m²/L.

8.3.3 Plasterboard Walls - New

Interior Paperfaced Plasterboard New - Walls - Ultra Low VOC Paint - Low Sheen. Best Environmental System.
Gloss Level: Low Sheen.
Coating Type: Water based.
System: DuSpec NZ_SD09034.
Fire Rating: Group Number 1-S; Report Number 5054.
1st Coat: DULUX Professional Enviro2 Acrylic Sealer Undercoat @ 14m²/L.

2nd Coat: DULUX Professional Enviro2 Interior Acrylic Low Sheen @ 16m²/L.
3rd Coat: DULUX Professional Enviro2 Interior Acrylic Low Sheen @ 16m²/L.

8.3.4 Timber Walls, Ceilings, Trims, Doors, Frames - Existing

Interior Timber Existing - Trim, Doors, Frames, etc. - Water Based Paint - Low Sheen. Best Environmental System.
Gloss Level: Low Sheen.
Coating Type: Water based enamel.
System: DuSpec NZ_SD08882.
Spot Primer: DULUX 1 Step Acrylic Primer Sealer & Undercoat @ 16m²/L.
1st Coat: DULUX Aquanamel Low Sheen @ 16m²/L.
2nd Coat: DULUX Aquanamel Low Sheen @ 16m²/L.

For Cedar substrates, 1 Step Oil based is recommended.

8.4 Dulux Painting General

8.4.1 Scope

Supply and apply the specified Dulux coating systems to the surfaces identified on the drawings and as noted in the schedules of the 'Dulux Painting Exterior' and/or 'Dulux Painting Interior' and/or 'Dulux Environmental Painting Exterior 'and/or 'Dulux Environmental Painiting Interior' sections within the Painting specification. All aspects of this work shall be in strict accordance with all relevant Dulux Technical Literature, DuSpec Specifications and Product Data Sheets (check www.duspec.co.nz, or call 0800 800 424 for the latest editions), other relevant product manufacturers' recommendations, and as indicated on the drawings and schedules.

No substitutions are permitted for any of the specified Dulux coating systems and their associated components and products.

8.4.2 Health & Safety

Supply protective clothing and equipment. Inform employees and others on site of any hazards, and put in place procedures for dealing with emergencies.

Applicators shall handle Dulux products in accordance with the manufacturer's requirements as set out in the DuSpec Specification Sheet and relevant Product Data Sheets and in a manner that prevents deterioration of the product and contamination of the environment.

Applicators shall be familiar with and comply with the manufacturer's Material Safety Data Sheet precautions for use, and must use appropriate safety gear and clothing during handling and use. Refer to Dulux for the Material Safety Data Sheets for every applicable product and comply with the safety procedures listed. Keep sheets on the site. Refer to www.dulux.co.nz/specifier.
Always use the proper equipment and working techniques in accordance with the MPNZA Painters hazard handbook; always wear personal protective equipment and clothing appropriate for the work being undertaken; always wear gloves when handling any solvents, including turpentine.

Where present, handle existing lead-based painted substrates and/or substrates containing asbestos in accordance with the MPNZA Painters hazard handbook and with all relevant WorkSafe NZ Guidelines and Codes of Practice - Asbestos; Lead-Based Paint.

Dispose of Dulux products in accordance with local government requirements. Do not permit products to enter or contaminate the stormwater system.

8.4.3 Materials

Use only those Dulux products for each coating system as specified in the relevant DuSpec Specification Sheet.

Under no circumstances combine paint or product from a different manufacturer as a component of a specified Dulux coating system, and do not substitute any Dulux product for another manufacturer's/branded product. The substitution of any Dulux product that is specified in a Dulux coating system DuSpec Specification Sheet shall invalidate all warranties associated with the work.

Use thinners and additives only when specified or directed by Dulux for the specific Dulux product and application - contact your Dulux representative for further advice.

Use paint strippers, cleaning agents, etching solutions, inhibitors for rust, mould etc., filling compounds, knotting and other surface preparation products and materials in accordance with the manufacturer's instructions and to suit the requirements of the substrate and coating system - if there is any doubt, contact your Dulux representative for further advice.

8.4.4 Conditions

Conform to the manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311, the MPNZA Specification manual, and the OSH Guidelines For the Provision of Facilities and General Safety in the Construction Industry.

Ensure compatibility of the substrate material with the Dulux coating system prior to commencing - in cases of doubt, contact your Dulux representative regarding the condition or preparation of a substrate.

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer to ensure that the Dulux coating system materials are compatible with the treatment and will not inhibit the coating system's performance - in cases of doubt, contact your Dulux representative before proceeding.

Unless stated otherwise, descriptions of areas in the schedules are general and simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except for unfinished and prefinished surfaces - in cases of doubt obtain written instruction before proceeding.

Before commencing, carefully remove hardware, fixtures and fittings, and set aside where they cannot be damaged or misplaced, and replace on completion. Do not paint hinges or hardware that cannot be removed.

Provide drop-sheets, coverings and masking necessary to protect surrounding surface, finished work, and fixtures and fittings from contamination, including dust, debris, paints and other liquids, and from damage.

8.4.5 Preparation

Refer to the specified Dulux coating system's DuSpec Specification Sheet and DuSpec Product Data Sheets for surface preparation requirements and procedures, and carry out all preparatory work in accordance with these for each substrate type - in cases of doubt, contact your Dulux representative before proceeding.

In the event that any substrate cannot be prepared to the required standard and won't allow the specified Dulux coating system to be applied and finished to the required standard, then do not proceed until the correct remedial work has been carried out. As necessary, contact your Dulux representative for further advice.

Repair cracks, holes, indented and damaged surfaces, and remove and/or repair sharp edges. Use suitable gap fillers to match the surface being prepared. Any special priming requirements of the fillers must be satisfied. Allow fillers to dry or set before sanding back flush with the surface. Prime or seal timber before using putty.

Carry out any off-site work undercover, in a well lit and ventilated, stable and weatherproof environment with an ambient temperature between 10°C and 30°C. Store all items, both before and after coating, undercover, in a clean and dry area and protect from moisture, contamination and damage at all times. Ensure that items are correctly spaced and stacked to allow air circulation and to prevent any sticking between coated surfaces.
Where off-site coatings are required/specified, the coatings must be applied to all surfaces of the item/fixture/fitting, including the surfaces that will be concealed when the item/fixture/fitting is installed.

Pre-treat any cut surfaces of preservative treated timber before priming - liberally coat end-grain timber and allow to soak in, then recoat. Ensure that all LOSP (light organic solvent-based preservative) treated timber has sufficiently flashed-off prior to coating.

Prime or seal and paint all both faces and all edges, including bottom edge, of all doors before hanging.

Painted, stained or clear-coated timber joinery shall have the primer and one undercoat, or the first two coats, applied to rebates and beads before glazing.

Allow new glazing putty to set in accordance with the putty manufacturer's requirements, then prime with either Dulux 1 Step Acrylic Primer Sealer & Undercoat or Dulux 1 Step Oil Based primer Sealer & Undercoat. Coat glazing putty as soon as it is sufficiently firm.

Check sealants for compatibility with the specified Dulux coating system prior to coating.

8.4.6 Application

Refer to the specified Dulux coating system's DuSpec Specification Sheet and DuSpec Product Data Sheets for coating application requirements and procedures, and carry out all coating application in accordance with these.

Thoroughly mix paints before application. Lift and fully disperse any settled pigment through the mix and ensure the paint is homogenous. Where more than one tinted container is required per coat to cover a large area, ensure consistency of colour between tinted containers is achieved prior to application. Do not apply any paint that has been coloured incorrectly - contact Dulux for replacement with the correctly coloured product.
Dulux normally only specify two coats of colour but with certain colours such as bold, brights and some corporate colours, three coats may be needed.

Defer painting of exterior surfaces until weather conditions are favourable - warm, dry days without frost or heavy dews. Avoid painting in direct sunlight any surface that absorbs excessive solar heat. As much as possible, apply paint in the temperature range between 15°C to 25°C. If temperatures fall outside the range of 10°C and 35°C, do not apply paint unless paints with the necessary temperature tolerance have been specified. Do not apply solvent-based paint if moisture is present on the substrate.

Painting work sequencing shall be in accordance with the DuSpec specification for the system and generally as follows:
- Complete surface preparation before commencing painting.
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the DuSpec specified sequences.
- Allow the full drying time between coats as stated in the DuSpec specification.
- Do not expose primers, undercoats and intermediate coats beyond the DuSpec recommended period before the next coat is applied.
- Finish broad areas before painting trim.
- Ensure batch numbers of tins are matched for whole areas.

Lightly sand primers, sealers, undercoats and intermediate coats to remove bound particles and surface imperfections, then immediately dust-off before applying the next coat.

As specified in the coating system's DuSpec Specification Sheet, using appropriate tools and equipment, apply each coat in the specified sequence to the correct thickness and so that the completed system has uniform coverage, colour, texture, finish and sheen, and is free of defects and blemishes. Ensure that proper coverage of corners, crannies, thin edges, cracks, end grain and difficult situations is achieved by each coat.

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

Each coat of paint and the completed paint system to have the following qualities and properties:
- uniform finish, colour, texture, sheen and hiding power.

- the specified number of coats applied.
- no blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, brush marks, ladder marks and blistering.
- proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application.

Correct any defective work immediately and recoat as required, following precisely the DuSpec specification for the coating system.

8.4.7 Completion

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at the completion of the building works. Clean glass inside and out to a clear finish.

Use Dulux EnviroWash disposal system for cleaning water-based paints off painting tools and equipment to minimise the environmental impact - contact Dulux on 0800 800 424 for further information about this system.

Reinstate all removed hardware, fixtures and fittings without damage to them or the painted surface - leave hardware correctly fitted and in proper working order.

Check that completed Dulux coating systems have been correctly applied and finished, with uniform coverage, colour, texture, finish and sheen, and are free of any defects, blemishes, damage and marking.
Leave all of this work complete and to the required standard in accordance with Dulux NZ Ltd. requirements.

As required or instructed, hand over part-used paint containers to the Client for maintenance touch-ups.

Leave the completed surfaces and surrounding surfaces clean and free of contamination from dust, paint and rubbish. Remove all rubbish and unused materials from the site.

Issue to the Owner a copy of the Dulux NZ Ltd. specific maintenance requirements and a copy of the Dulux NZ Ltd. Product Warranties or the Dulux Project Warranty and the Painting sub-contractor's/applicator's Application Warranty for the completed works.

9 FLOOR COVERINGS

9.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

9.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1884:2013(NZS AS)	Floor coverings - Resilient sheet and tiles - Installation practices
2455.2:2007(AS/NZS)	Textile floor coverings - Installation practice - Carpet tiles
3661.2:1994(AS/NZS)	Slip resistance of pedestrian surfaces - Part 2: Guide to the reduction of slip hazards
4586:2004(AS/NZS)	Slip resistance classification of new pedestrian surface materials
NZBC D1	Access Routes

9.3 Carpet & Resilient Floor Coverings

9.3.1 Scope

Supply and install the specified Floor Coverings and flooring products to the areas and surfaces, layouts and details shown on the drawings, complete with all accessories. All aspects of this work shall be in accordance with the specified floor covering manufacturers' technical literature and installation requirements, relevant Standards and Code requirements, other relevant product manufacturers' recommendations, and as shown on the drawings.

No substitutions are permitted for the specified Floor Coverings and flooring products.

9.3.2 Floor Coverings

9.3.2.1 Vinyl Sheet - Homogeneous

Homogeneous vinyl sheet flooring; polyurethane (PUR) reinforced, to the specified product, thickness, and colour and pattern. Installed in accordance with the manufacturer's requirements and AS/NZS 1884 and AS/NZS 4586 to the locations and layout shown on the drawings.

Manufacturer, brand name & range:
Thickness:
Colour/Pattern code:
Slip Resistance values:
Location:

9.3.2.2 Vinyl Tile

Flexible vinyl tile or plank flooring; polyurethane (PUR) reinforced, to the specified product, size and thickness, and colour and pattern. Installed in accordance with the manufacturer's requirements and AS/NZS 1884 and AS/NZS 4586 to the locations and layout shown on the drawings.

Manufacturer, brand name & range:
Size & thickness:
Colour/Pattern code:
Slip Resistance values:
Installation method/direction:
Location:

9.3.3 Trim & Accessories

9.3.3.1 Height Transition Strip

Height transition strip; to the specified product, material, and finish and colour, and size. Installed as a height transition strip between floor coverings with variation in thickness in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

Manufacturer, brand name:
Material:
Finish & colour:
Size:
Floor coverings:
Location:

9.3.3.2 Expansion Joint Cover Strip

Expansion joint cover strip; to the specified product, material, finish and colour, and size. Installed in conjunction with vinyl sheet/tile floor coverings as a flexible cover strip over expansion and control joints in accordance with the manufacturer's requirements to the locations and details shown on the drawings.

Manufacturer, brand name:
Material:
Finish & colour:
Size:
Floor covering:
Location:

9.3.4 Floor Levelling Compound

Floor levelling compound, as specified. Applied as a surface preparation to uneven floor substrates for subsequent floor covering laying in accordance with the manufacturer's requirements.

Manufacturer, brand name & type:
Substrate:

Floor covering:
Location:

9.3.5 Adhesives

Floor covering adhesives shall be as recommended by the floor covering manufacturer, and be suitable and compatible with the specified flooring product, substrate type and environment, and the flooring product's end use; and shall be applied in accordance with the adhesive manufacturer's instructions. Seal or prime porous substrates exactly as recommended by the adhesive manufacturer.

9.3.6 Co-operation

Co-operate with other trades to ensure that all preliminary and preparatory works are completed to specification and as shown on the drawings.
Co-ordinate with other trades as required to install the specified floor coverings and accessories.

9.3.7 Workmanship

All installation work shall be carried out by experienced and competent floor layers, familiar with the products specified and installation techniques, under the direct supervision of a Registered National Flooring Association (NFA) Member, in accordance with the manufacturer's installation requirements, NZS/AS 1884, AS/NZS 2455.1, AS/NZS 2455.2 and AS/NZS 4586 as relevant, and as noted and detailed on the drawings.
Use only approved adhesives that are compatible with the specified floor covering product and the substrate as recommended by the floor covering manufacturer.
The building must be fully enclosed and weathertight with all doors and necessary fittings and trim installed prior to laying floor coverings.

9.3.8 Delivery & Handling

Store and handle all floor covering products and accessories in accordance with the manufacturer's recommendations. Store products and accessories under cover and out of direct sunlight on a flat and level surface; keep dry and protect from damage and contamination at all times.
Do not use damaged or defective flooring products or accessories, or products that are beyond their designated shelf life. Do not damage or mark or distort flooring products and accessories during handling.
Allow floor coverings and accessories to properly condition for a minimum of 24 hours, or as recommended by the manufacturer, prior to laying in accordance with the manufacturer's requirements. Unless recommended otherwise by the manufacturer, do not lay floor coverings below 15^{o}C room temperature.

9.3.9 Substrate Preparation

9.3.9.1 General

Ensure the substrate surface is free of oil, grease and other contaminants, then sweep or vacuum as required to ensure it is absolutely clean. Ensure that any expansion or crack control joints are appropriately trimmed - do not install floor coverings over them.
The commencement of work on each section of floor shall be deemed to indicate a full acceptance by

the relevant Flooring Subcontractor that all preparatory works by other trades are appropriate to achieve the required finished results.

9.3.9.2 Existing Concrete Floors

Strip off any remaining existing floor coverings, adhesive and other surface contaminants. Existing concrete substrates must be compliant with NZS 3114 'U3 Surface Finish' and with the floor covering manufacturer's requirements. Check for moisture content by hygrometer reading to BRANZ BU330 - do not commence laying floor coverings until the substrate is surface-dry and the moisture readings are less than 75% relative humidity over the entire surface.
Grind off any high spots on the concrete slab, and using the specified proprietary levelling compound repair flush with feathered edges any low spots or damaged areas then grind smooth.
Lightly grind or shot blast any surface that is glazed to the extent that may compromise the adhesive bond. Leave the entire surface clean and free of dust and contaminants etc.

Location:

9.3.10 Installation

9.3.10.1 Vinyl Floor Coverings

Install vinyl floor coverings and accessories, including all jointing, in accordance with the manufacturers' recommendations, procedures and techniques (includes heating and temperature settings), and as shown on the drawings.

Allow vinyl floor coverings to properly condition in accordance with the manufacturer's recommendations prior to laying. Turn underfloor heating systems off 48 hours prior to installation and leave off during installation and for a minimum of 48 hours after completion. Thoroughly clean each area before commencing work. Seal or prime as necessary any porous surface receiving floor covering adhesive, and apply adhesive exactly to the manufacturer's recommendations.

Confirm the location of all vinyl sheet joints and seams prior to laying. Install vinyl sheet rolls in consecutive sequence and in the same direction. Do not install vinyl floor coverings over expansion joints - use only the specified expansion joint cover strip and neatly finish vinyl flooring in accordance with the cover strip manufacturer's requirements.

Vinyl sheet flooring accurately laid and fitted, and fully bonded to the substrate, and neatly coved, or as noted, at wall and upstand edges, and butterfly mitred where required. All vinyl sheet seams, coving and corner fill-sections thermo-welded with colour-matching rods in continuous seams unless noted otherwise on the drawings. Neatly trim welds and finish smooth and flush with the vinyl sheet. Roll vinyl sheets with a suitably weighted roller as recommended by the manufacturer to ensure maximum adhesion.

Accurately install stair tread nosings and lay pre-cut vinyl sections to each stair tread and riser; pencil coved along the back of the tread and finished neatly into or under the nosing edge as appropriate. Install vinyl skirting, capping and edge trim, transition strips, etc., as noted and detailed on the drawings; all finished straight and level and true to line.

Install vinyl tiles or planks to the required layout pattern from the centre of the space so that the perimeter edges are closed with at least half a tile or plank. Tiles and planks accurately laid true to line and with joints flush and even. Roll tiles with a suitably weighted roller as recommended by the manufacturer to ensure maximum adhesion.

Keep the working area cordoned off and protected during installation and protect completed installation work from damage and contamination until hand over of the works as programmed/scheduled.

9.3.11 Completion

Ensure that the specified floor coverings have been installed correctly, and that all seams, joints and accessories have been and completed correctly. Check for damage and defects and repair or replace as necessary.
Thoroughly clean the installed floor coverings in accordance with the manufacturers' recommended techniques and procedures.
Carry out any product specific finishing/polishing applications as recommended only by the floor covering manufacturer.
Leave the works area clean and remove all rubbish and waste material from the site.

Protect the completed works from damage, trafficable dirt and grime, and stains as necessary while other works are in progress.

Issue to the Owner a copy of the Manufacturers' maintenance requirements and a copy of the Manufacturers' Materials Warranties and the Applicators' Installation Warranties for all of the installed floor coverings.

10 PLUMBING

10.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections and the Hydraulic Engineers Specification and Drawings

10.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

1221:1997(AS/NZS)	Fire hose reels
1254:2010(AS/NZS)	PVC-U pipes and fittings for stormwater and surface water applications
1260:2017(AS|NZS)	PVC-U pipes and fittings for drain, waste and vent applications
1477:2017(AS|NZS)	PVC pipes and fittings for pressure applications
1546.1:2008(AS/NZS)	On-site domestic wastewater treatment units - Septic tanks
1596:2014(AS/NZS)	The storage and handling of LP Gas
2032:2006(AS/NZS)	Installation of PVC pipe systems
2033:2008(AS/NZS)	Installation of polyethylene pipe systems
2492:2007(AS/NZS)	Cross-linked polyethylene (PE-X) pipes for pressure applications
2537.1:2011(AS/NZS)	Mechanical jointing fittings for use with crosslinked polyethylene (PE-X) for pressure applications - Part 1: Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - General
2642.2:2008(AS/NZS)	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
2712:2007(AS/NZS)	Solar and heat pump water heaters - Design and construction
3500.1:2015(AS|NZS)	Plumbing and drainage - Part 1: Water services
3500.1:2018(AS|NZS)	Plumbing and drainage Part 1: Water services
3500.2:2015(AS|NZS)	Plumbing and drainage - Part 2: Sanitary plumbing and drainage
3500.2:2018(AS|NZS)	Plumbing and drainage Part 2: Sanitary plumbing and drainage
3500.3:2018(AS|NZS)	Plumbing and drainage Part 3: Stormwater drainage
3500.4:2015(AS|NZS)	Plumbing and drainage - Part 4: Heated water services
3500.4:2018(AS|NZS)	Plumbing and drainage Part 4: Heated water services
3500.5:2012(AS/NZS)	Plumbing and drainage - Part 5: Housing Installations
3501:1976(NZS)	Specification for copper tubes for water, gas, and sanitation
4020:2018(AS|NZS)	Testing of products for use in contact with drinking water
4121:2001(NZS)	Design for access and mobility: Buildings and associated facilities
4517:2010(NZS)	Fire sprinkler systems for houses

4602:1988(NZS)	Low pressure copper thermal storage electric water heaters
4603:1985(NZS)	Installation of low pressure thermal storage electric water heaters with copper cylinders (open-vented systems)
4606.1:1989(NZS)	Storage water heaters - General requirements
4607:1989(NZS)	Installation of thermal storage electric water heaters: valve-vented systems
4613:1986(NZS)	Domestic solar water heaters
4614:1986(NZS)	Installation of domestic solar water heating systems
4617:1989(NZS)	Tempering (3-port mixing) valves
4692.1:2005(AS/NZS)	Electric water heaters - Energy consumption, performance and general requirements
5601.1:2013(AS|NZS)	Gas installations - Part 1: General installations
7602:1977(NZS)	Specification for polyethylene pipe (Type 5) for cold water services
7643:1979(NZS)	Code of practice for the installation of unplasticized PVC pipe systems
7646:1978(NZS)	Specification for polyethylene pipes and fittings for gas reticulation
AS/NZS 3500.5:2012	Plumbing and drainage - Part 5: Housing installations
NZBC B2/AS1	Durability
NZBC G11	Gas as an Energy Source
NZBC G12	Water Supplies

10.3 General

Carry out all works necessary to leave the water, waste, vent and soil systems serving the sanitary fittings and the plumbing hardware shown on the drawings or specified below in correct working order complete with all ancillary systems (safetrays, floor drains, overflows, relief valves, etc.) required, and with all normal incidentals customarily installed by this trade.

Comply with the Building Code, Territorial Authority By-laws and statutory authority Regulations as appropriate. Obtain all necessary permits and consents, serve all necessary notices, arrange for all tests and pay all fees and customary charges in connection with the required works.

10.4 Elements

10.4.1 Sanitary Fittings

Supply and fix all of the sanitary fittings as scheduled on the drawings. All fittings checked on delivery for 'perfect' condition, and all fittings plain white. Supply and fix all normal accessories that are not usually supplied with the fitting.
The Plumber is responsible for fittings from delivery until Practical Completion of the contract.

10.4.2 Appliances

All appliances are exactly identified on the drawings notes. Main Contractor will establish, in consultation with the Plumber and Electrician, which of them will be supplied by each of these trades.

10.5 Materials

10.5.1 Materials

Materials shall be delivered with packaging and labeling intact. Incidentals (jointing compounds, PTFE tape, seals, washers, silfos, solvent cements, etc.) shall be completely appropriate for the application involved. The use of imperfect items or items damaged in any way is always subject to approval.

10.5.2 Alternatives

The materials and elements specified indicate the required standards for these works. Alternatives which are equal to or superior to these materials and elements may be tendered for approval.

10.5.3 Materials Separation

Separate dissimilar metals in any circumstances which could produce contact or electrolytic action by a water film, with thick plastic tape, bituminous felt or other inert material. Pipes in contact with or built into concrete or masonry shall be fully spiral wrapped in Denso tape or equal.

10.6 Systems

10.7 Workmanship

10.7.1 Workmanship

All plumbing work shall be carried out by, or under the direct control of, properly qualified tradesmen, and shall be to recognised high standards.

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604 restrictions on the holing and checking of joists and beams. Chasing and checking of other materials only to approval. Install seismic restraints to storage tanks and HWCs.

Weatherseal wherever pipes, screws, bolts or other fastenings penetrate an external surface, and particularly roofing; seal with gaskets, flashings (and overflashings if necessary) or mastic as appropriate - any damage that results from failure of such seals will be made good at the Plumber's expense.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Plumber's expense.

10.7.2 Pipework

Joints between pipes of different materials shall always be to the approval of the TA Plumbing Inspector.

Pipework set-out neatly with a minimum number of bends, and more or less parallel to and at right angles to structural elements - avoid diagonal piping.

All internal pipework shall be concealed except where otherwise is either shown or approved. Exposed pipework shall be accurately and neatly run. Arrange all pipework (and particularly traps) in a manner which will allow maximum future accessibility for repairs or maintenance. Arrange for access panels to any primary maintenance positions, and install conveniently located isolating valves for each group of fittings. Wingbacks securely and squarely fixed. Crox unions usually acceptable only at the final connection to fittings. Install white plastic flanges where pipes penetrate linings in visible locations.

Where pipes are covered with nail fixed linings and trim ensure that their positions are marked on the linings to minimise the risk of subsequent nailings penetrating the pipe. Any such damage shall be rectified immediately, with all consequential damage made good.

Set pipework out in straight runs to even gradients. Fix all pipes to the structure sufficiently to fully support and to prevent sagging or vibration. Clips and saddles shall be the same material as the pipe. Exterior pipes on stand-off brackets. Fixings to the exterior or damp locations shall all be hot dip galvanized unless otherwise noted. Sleeves for pipes or drains penetrating concrete or masonry shall be uPVC, 20mm minimum larger internal diameter than the external diameter of the pipe, finished flush with concrete or masonry, and packed and mastic sealed.

Close open ends of the systems during construction to prevent the entry of foreign matter.

10.7.3 Temperature Movement

All work shall respect in full all probable thermal movements - layouts, fixings and jointings shall be arranged to allow thermal movement without risk of prejudice to watertight conditions, or risk of damage from straining of the pipes which will generate failures.
In particular, observe best local trade practice to avoid problems arising from freezing conditions.

10.7.4 Fire Wall/Ceiling Penetrations

Ensure that where drainage pipe work penetrate through fire rated floor or wall areas that these penetrations are stopped with intumescent foaming sealant for joints up to 10mm, and with intumescent stopping putty where the gap exceeds 10mm. Where required fit approved intumescent type fire collars to pipes located such that the fire rating of the wall or ceiling is maintained.

10.7.5 Testing

All plumbing services shall be completed in stages which will allow for proper testing under normal working pressures prior to the application of insulation, concealment or other enclosure. Testing of piped water services shall be by hydrostatic testing in accordance with AS/NZS 3500.1 and shall not show any leakage when subjected to a hydrostatic pressure of 1500kPa for a period of not less than 30 minutes. All leaks remedied and retested. On completion the whole of the plumbing services to be subjected to full operational tests in the presence of the plumbing inspector, with any defects revealed in these tests properly remedied.

10.7.6 Warranties

Warranty cards and manufacturer's guarantees for all items supplied and installed by this trade shall be correctly filled in and handed over at Practical Completion.

11 ELECTRICAL

11.1 Preliminary

Refer to General Conditions of Contract and the Special Conditions in this Specification as appropriate. Read this section in conjunction with all other trade sections.

11.2 Compliance

Comply with the New Zealand Building Code 1992 including all revisions and amendments, Verification Methods where appropriate, and construction principles that are embodied in the Acceptable Solutions.

Comply with all relevant provisions and recommendations of:

2053.1:2001(AS/NZS)	Conduits and fittings for electrical installations - General requirements
2201.1:2007(AS/NZS)	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
2293.2:2019(AS|NZS)	Emergency lighting and exit signs for buildings - Part 2: Routine service and maintenance
3000:2018(AS|NZS)	Electrical installations - Known as the Australian/New Zealand Wiring Rules
3100:2009(AS/NZS)	Approval and test specification - General requirements for electrical equipment
3112:2011(AS/NZS)	Approval and test specification - Plugs and socket-outlets
5000.1:2005(AS/NZS)	Electric cables - Polymeric insulated - For working voltages up to and including 0.6/1 (1.2) kV
60335.2.30:2015(AS|NZS)	Household and similar electrical appliances - Safety - Part 2.30: Particular requirements for room heaters
60335.2.30:2015(AS|NZS)INCIEC	Household and similar electrical appliances - Safety - Part 2.30: Particular requirements for room heaters
60335.2.35:2013(AS/NZS)	Household and similar electrical appliances - Safety - Part 2.35: Particular requirements for instantaneous water heaters
60598.2.2:2016(AS|NZS)	Luminaires - Part 2.2: Particular requirements - Recessed luminaires
6104:1981(NZS)	Specification for emergency electricity supply in buildings

11.3 Elements

11.3.1 Appliances

All appliances are exactly identified on the drawings notes. Main Contractor will establish, in consultation with the Plumber and Electrician, which of them will be supplied by each of these trades.

The Electrician shall supply appliances that are their responsibility, install them exactly in accordance with their manufacturer’s instructions, and protect them until completion.

11.3.2 Light Fittings

All light fittings are identified as to type on the drawing, and will be supplied by the Principal. Take delivery, install in accordance with any directions supplied and protect until Practical Completion.

11.3.3 Tele Communications

Workmanship shall be recognised best trade practice, and in accordance with the manufacturers' recommendations. All work shall be by competent and experienced operatives.

11.3.4 Other Wired Services

Co-operate with all other trades to ensure that the following services are installed complete and in accordance with their manufacturer’s recommendations with all normal or necessary incidentals as per Drawings

11.3.5 Electronic Security System

As per existing, no changes

11.4 Materials & Control

11.4.1 Materials

All materials delivered with packaging and labeling intact. All required incidentals (insulating tape, seals, fixings, etc.) shall be completely appropriate for the application involved. The use of items damaged in any way is subject to approval in each instance.

11.5 Systems

11.6 Workmanship

11.6.1 General

Supply and install all materials, including all necessary minor and incidental items, for proper completion of all of the electrical services specified or shown on the drawings. The contract will not be deemed to be complete until the Electrician has provided an Electrical Certificate of Compliance (made available to the Contractor in time for the Code Compliance Certificate application).

Obtain all necessary permits and consents, serve all notices and pay all fees in and customary charges connection with the works.

The position of switches, light and power outlets and other fittings, although shown specifically in some instances, are in general only shown diagrammatically. The exact location of each of these items will be as directed on site by the Architect/Designer; the Electrician shall give reasonable notice of when this information is required. Items positioned in contravention of this shall be repositioned if directed, including rewiring if necessary, all at the Electrician's expense.

Warranty cards and manufacturers guarantees for items supplied and installed by this trade shall be filled in correctly and handed over at Practical Completion. Arrange all circuits to obtain an optimum balance of the system, and check and reconnect where necessary to achieve this on completion. Leave the works clean and tidy and in full operational order.

11.6.2 Co-operation

Co-operate with all other trades and attend upon the Concretor and Carpenter to set out all required penetrations and to ensure that all wiring and fittings are correctly incorporated as work proceeds. The Carpenter will provide and fix all necessary dwangs and timber supports in locations determined by the Electrician.

11.6.3 Workmanship

All electrical work shall be carried out by, or under the direct control of, registered tradesmen, and shall be to recognized high standards. All work shall be such as to leave a neat, efficient and robust installation. Neatly label switchboards to identify each circuit.

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used; observe NZS 3604: 2011 restrictions on the holing and checking of joists and beams. Chasing and checking of other materials shall be only to approval.

Adequately protect all surfaces. Any damage to fittings or surfaces made good by the appropriate trade at the Electrician's expense.

11.6.4 Wiring

Joints within cable runs will not normally be accepted. TPS cable shall be adequately supported, and clipped at regular intervals. At terminations all strands of conductors shall be fully secured in a terminal block or clamped under a screw head washer; do not cut away any strands. Wiring which terminates in enclosed fittings and/or where subject to heat liable to cause deterioration, shall be high temperature type, with the tails made off with heat resisting sleeves, to protect the permanent wiring.

Wire more or less parallel to and at right angles to the structural elements - avoid any diagonal wiring. Layout of the principal distribution wiring shall be to approval. Position all wires to minimise the risk of damage from subsequent nailing of linings etc.

Generally, do not run TPS horizontally within timber walls except in the area up to 300mm above floor. Wire in the ceiling framing and drop vertically to outlets and switches.

Do not run TPS horizontally within partitions except in the area up to 300mm above floor. Wire in the ceiling void and drop vertically to outlets and switches. Principal wiring in the ceiling void shall be supported on adequate catenaries.

Where cables pass through fire rated walls or floors use a fire barrier or fire rated sealing compound to seal the space after installation of the cables.

11.7 Elements

11.8 Workmanship

11.9 Systems

11.10 Materials & Control

11.10.1 Materials

All materials delivered with packaging and labeling intact. All required incidentals (insulating tape, seals, fixings, etc.) shall be completely appropriate for the application involved. The use of items damaged in any way is subject to approval in each instance.