3a Mara Way

Project Specification

3 Mara Way, Lower Shotover, Queenstown, New Zealand
Project Ref: DW1847
Date: 05 November 2026

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

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7701 ELECTRICAL BASIC 179

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1220 PROJECT

1 GENERAL

This general section describes the project including:

- A description of the work
- Design construction safety
- Principal's Health & Safety matters
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

New Residential Dwelling addition to be Standard NZS3604 design and Engineered design. Structure to consist of Engineered Foundation Slab and timber framed walls. Refer to Architectural Plans for further information.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

The project designers are unaware of unusual or atypical features, which a reasonably experienced contractor may not be aware of, that may present a hazard or risk during a typical construction process. The Contractor is still required to undertake its own assessment, to determine if they consider there are any further safety matters and provide for these in carrying out the construction of the work.

Principal's Health & Safety Matters

1.5 PRINCIPAL'S KNOWN SITE HAZARDS

Site hazards known to the principal are:

Obtain a copy of the principal's site health and safety plan.

1.6 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

Obtain a copy of the principal's site health and safety plan.

Site

1.7 SITE

The site consists of: 600m2
As shown on drawing: Refer to A101 - SITE PLAN

1.8 LEGAL DESCRIPTION

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

1.9 SITE FEATURES

Refer to A001 - SITE PLAN

Site environment - Durability

1.10 EXPOSURE ZONE

The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.

The site zone is: B (Low)

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Site environment - Wind

1.11 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.

Building wind zone High/1.20kPa (refer to NZS 3604, table 5.4)

Site environment - Seismic

1.12 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.

The earthquake zone is: Zone 3

Archaeological discovery

1.13 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site may be classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.



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1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

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

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

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

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

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

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

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

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

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1240 ESTABLISHMENT

1 GENERAL

This general section relates to site establishment including:

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

Notices and approvals

1.1 STATUTORY OBLIGATIONS

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

1.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

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

1.3 NOTIFY NETWORK UTILITY OPERATORS

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

Inspections

1.4 CARRY OUT INSPECTIONS

As required by QLDC

Site preparation

1.5 SITE AND SOIL SURVEYS

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

1.6 GROUND CONDITIONS

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

Temporary construction

1.7 TEMPORARY BUILDINGS

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

1.8 TEMPORARY SITE FENCING

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

1.9 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

1.10 SITE - PROJECT SIGN

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

- Title of contract
- Principal's name
- Contractor's name
- Consultants as listed in general section 1222 PROJECT PERSONNEL
- If the contractor wishes, names of subcontractors.

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First aid

1.11 FIRST AID EQUIPMENT
Provide first aid equipment.

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1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 TEMPORARY ROADS

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

1.5 CONSULTANTS TEMPORARY SITE OFFICE

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

1.6 SITE FENCING

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

Construct the fence with:

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

1.7 SITE FENCING - NON-PUBLIC AREAS

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

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

1.8 SITE HOARDINGS

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

Construct hoardings with continuous cladding of:

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

1.9 LIGHTING

Provide temporary lighting as necessary to protect the public and others, for the proper execution of the works and to meet the requirements of territorial or other authority.

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1.10 GANTRIES, PLANKED FOOTWAYS, GUARD RAILS

Provide temporary gantries, planked footways and guard rails as necessary to protect the public and others, for the proper execution of the works and to meet the requirements of territorial or other authority.

1.11 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

Prevent silt run off by:

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

Provide sediment control by:

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

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

1.12 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

Provide appropriate measures to prevent cement/concrete washwater or slurry run off to; drains or waterways, landscaped areas new or remaining and adjoining public or private properties. Comply with territorial and other authority requirements relating to cement/concrete washwater.

Control run off from:

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

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

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

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

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

Spilt or surplus material:

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

Pump washwater away from drains, waterways and adjoining property.

1.13 EXCAVATION SAFETY

To the Health and Safety at Work Act 2015.

Carry out excavation to WorkSafe NZ, Good Practice Guidelines - Excavation Safety. This may include deep excavation, trenching, and areas behind unfilled retaining walls.
Carry out excavation using plant and equipment suitable for the purpose.



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Scaffolding

1.14 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:

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

Temporary services

1.15 WATER

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

1.16 ELECTRICITY

To AS/NZS 3012.

Nominate the person to install and be responsible for the complete temporary electrical installation. The name and designation of the person responsible is to be displayed prominently and close to the main switch or circuit breaker.

Inspect and overhaul the installation at such intervals as are prescribed by the network utility operator but not more than three monthly intervals.

1.17 TELEPHONE

Provide on-site temporary telephone facilities.

1.18 COMPUTER FACILITIES

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

1.19 PRINTER

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

1.20 IMAGING

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

Care and protection - Site

1.21 LOCATE AND PROTECT SURVEY MARKS

Review information provided relating to survey marks. Physically locate and protect survey marks. Where required use a licensed cadastral surveyor to reinstate survey marks disturbed during construction.

1.22 LOCATE EXISTING SERVICES

Review information provided relating to underground and above ground services. Physically locate the position of all such services. Arrange with the network utility operator for all necessary exploratory work, location, protection, isolation, off-setting, reinstatement or alterations required. Record any alterations made to such utilities.

1.23 PROTECT EXISTING SERVICES

Protect existing services and parts of service systems, whether indicated or not, that are to remain in place during the execution of the works. Provide temporary caps or covers to prevent the ingress of dust and other contaminants into the systems, ducts, pipes etc. Reinstate where required and repair any damage resulting from carrying out the contract works.

1.24 PROTECT EXISTING LANDSCAPE ELEMENTS

Protect existing trees, fences, gates, walls, gardens and other designated landscape features which are to remain in position during the execution of the works. Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.

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1.25 MAKE GOOD - SITE

Make good all damage to existing roads, footpaths, grounds, services, landscape elements and site features caused in carrying out the contract works.

Care and protection - Project

1.26 TEMPORARY PROTECTION

Provide and maintain temporary protection as required to protect products during transport, storage and handling. Provide temporary protection as required to protect the work in progress and the finished work. Refer to 1270 CONSTRUCTION for removal of protection.

1.27 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous

1.28 CONSTRUCTION KEYING AND SECURITY

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

1.29 TEMPORARY STORAGE

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

Rubbish removal

1.30 PERIODIC RUBBISH REMOVAL

Maintain on site appropriate means for the storage and removal of construction waste material. Where required or appropriate provide for the separate storage of recyclable waste and other materials requiring special disposal.



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1270 CONSTRUCTION

1 GENERAL

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

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

1.1 SCHEDULE SECTION

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

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

Quality control and assurance

1.2 QUALITY ASSURANCE

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

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

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

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

1.3 PROVIDE QUALITY PLAN

Prepare a quality plan for the execution of the contract works and submit a copy of the quality plan to the Contract Administrator within 10 Working Days of the date of award of the contract. The quality plan shall describe the procedures for meeting the requirements of the contract in respect of:

- Materials and workmanship
- Monitoring and maintaining subcontractors' performance
- Record keeping
- The level of documentation for signing off the contract works as complete
- Procedures to ensure that all persons engaged in undertaking the contract works are qualified, experienced and trained for the work they are undertaking
- Inspection and testing required by the contract
- Auditing the quality plan

1.4 REVIEW OF QUALITY PLAN

Within 5 working days of the contractor submitting a quality plan to the contract administrator for review, the contract administrator may advise that:

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- they have completed their final review, or
- that they have undertaken a review and require resubmission of the quality plan.

Review by the contract administrator of the quality plan does not make the quality plan a contract document. The contractor at all times remains responsible for the construction of the Works. If resubmission of a quality plan is required, the contract administrator will give their reasons. The contractor shall take account of the reasons and resubmit a revised quality plan within a period of 5 working days.

1.5 COMMENCEMENT OF WORK

Do not commence any part of the contract works, other than establishment, setting out and site preparation until the contract administrator has completed their final review of the quality plan.

1.6 NOTICE

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

1.7 NOTIFIABLE WORK

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

Noise and nuisance

1.8 LIMIT CONSTRUCTION NOISE

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

1.9 ACCEPTABLE NOISE LEVELS

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

1.10 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.11 INCONVENIENCE TO OTHERS

When the works are to be carried out in or around occupied premises, ascertain the nature and times of occupation and use. Carry out the works in a manner to minimise inconvenience, nuisance and danger to occupants and users.

1.12 ROADWAY AND FOOTPATH

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

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1.13 VEHICLE CROSSING

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

1.14 TRAFFIC SAFETY

The management of traffic safety on-site and related traffic off-site, to WorkSafe Managing Work Site Traffic - Good Practice Guidelines. Movement on- and off-site also to territorial authority and/or NZTA requirements.

1.15 DIRT AND DROPPINGS

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

1.16 DAMAGE AND NUISANCE

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

1.17 SMOKE FREE REQUIREMENTS

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

1.18 RESTRICTIONS

Do not:

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

Set-out and tolerances

1.19 SURVEY INFORMATION

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

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

1.20 DATUM

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

1.21 SET-OUT

Set out the work to conform with the drawings.

1.22 SET-OUT BY LICENSED CADASTRAL SURVEYOR

Before commencing construction provide the contract administrator with a certificate prepared by a licensed cadastral surveyor that the set-out is complete and that the building is accurately placed on the site.

During construction provide the contract administrator with a certificate, prepared by the same licensed cadastral surveyor confirming the set-out of the foundations and grid lines. Necessary adjustments are to be determined and agreed to by the contract administrator before proceeding further.

1.23 CONFIRM HEIGHT IN RELATION TO BOUNDARY

Arrange for the licensed cadastral surveyor to provide a certificate certifying that the building has been constructed within the allowed height in relation to boundary. Obtain details from the principal of the person they have engaged to carry out this certification and advise the surveyor when they can carry out the required survey.

Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator.

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1.24 USE OF SET-OUT INSTRUMENTS

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

1.25 CHECK DIMENSIONS

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

1.26 TOLERANCES

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

Concrete construction:	To NZS 3109 Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To NZS 3114 Concrete surface finishes
Masonry construction:	To NZS 4210 Masonry construction: Materials and workmanship Clause 2.6.5 Tolerances Table 2.2 Maximum tolerances
Structural steelwork:	To NZS 3404.1 Steel structures standard Section 14.4 Tolerances (after fabrication) Section 15.3 Tolerances (erection)
Timber framing:	To NZS 3604 Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

Execution

1.27 EXAMINE PREVIOUS WORK

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

1.28 REPORT DEFECTIVE PREVIOUS WORK

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

1.29 EXECUTION GENERALLY

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

1.30 EXECUTION - NO DETAIL IS PROVIDED

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

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

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

1.31 EXECUTION - ACCEPTABLE SOLUTION IS REFERRED TO

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

1.32 MINIMISE DELAYS DUE TO WEATHER

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

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Defective or damaged work

1.33 DEFECTIVE OR DAMAGED WORK

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

Hot work - fire safety

1.34 HOT WORK

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

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

1.35 COMBUSTIBLE MATERIAL

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

1.36 HOT WORK PERMIT

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

1.37 FIRE SYSTEMS

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

1.38 DURING SUSPENDED WORK

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

For hot works in confined spaces, prevent potential ignition of flammable gases, to NZS 4781 clause 6.5.

Qualifications

1.39 QUALIFICATIONS GENERALLY

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

1.40 QUALIFICATIONS WORKERS – RESTRICTED BUILDING WORK

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

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

1.41 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

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

1.42 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

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1.43 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

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

1.44 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.45 REPLACEMENT OF PERSON

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

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

Products

1.46 NEW PRODUCTS

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

1.47 COMPATIBILITY OF PRODUCTS

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

1.48 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

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

Refer to individual work sections for any special requirements.

1.49 SUBSTRATE CONDITIONS

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

1.50 INSTALLING PRODUCTS

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

1.51 COMPLY WITH STANDARDS

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

1.52 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

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1.53 INCOMPATIBLE PRODUCTS

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

Samples

1.54 SAMPLES FOR REVIEW

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

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

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

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

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

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

Refer to SAMPLES clauses in work sections for further detail.

1.55 CONTROL SAMPLES

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

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

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

1.56 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.57 PROTOTYPES - TESTING

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



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

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

1.58 PROTOTYPES - REVIEW

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

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

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

1.59 PROTOTYPES - GENERAL

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

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

Spares & maintenance products

1.60 SPARES & MAINTENANCE PRODUCTS

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

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

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

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

Cleaning during the works

1.61 PERIODIC SITE CLEANING

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

1.62 TRADE CLEANING

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

Remove protection

1.63 REMOVE PROTECTION

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

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

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

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Refer to individual work sections for any special removal requirements.

Completion

1.64 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.65 LEAVE WORK

Leave work to the standard required for the following procedures.

1.66 COMPLETION - TESTS & CERTIFICATION

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

1.67 REMOVE CONSTRUCTION WASTE

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

1.68 COMPLETE ALL SERVICES

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

1.69 CLEANING BY CONTRACTOR

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

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

1.70 CLEANING BY COMMERCIAL CLEANER

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

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

Commissioning

1.71 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.72 MOVING PARTS

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

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1.73 COMMISSIONING - TESTS & CERTIFICATION

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

1.74 INSTRUCTION AND DEMONSTRATION

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

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

1.75 SECURITY AT COMPLETION

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

Practical completion submission

1.76 ADDITIONAL PRACTICAL COMPLETION INFORMATION

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

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

Defects period submissions

1.77 DEFECTS REMEDIATION - SUBMISSIONS

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

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

Completion submissions

1.78 FINAL COMPLETION - SUBMISSIONS

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

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

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1278SR SCHEDULE OF SLIP RESISTANCE TESTING

1 GENERAL

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

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

This section includes schedules identifying work sections with:

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

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

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

Slip resistance - surfaces not requiring testing

1.4 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

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

6221M Mapei Floor Tiling Solutions

1.5 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

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

6221M Mapei Floor Tiling Solutions

Slip resistance - surfaces requiring testing

1.6 SLIP RESISTANCE - SURFACES REQUIRING TESTING

Refer to the following work sections for surfaces to be tested for slip resistance, including location, test condition, slope requirement and specific reporting requirements:

6221M Mapei Floor Tiling Solutions

1.7 TEST METHODS & MINIMUM TEST VALUES

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

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

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

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

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

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

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0.521	1 in 11	5.5°
0.525	1 in 10	5.7°
0.543	1 in 9	6.5°
0.557	1 in 8	7.125°

1.8 GENERAL REPORTING REQUIREMENTS

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

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

Slip resistance - additional items

1.9 SLIP RESISTANCE - ADDITIONAL ITEMS

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

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2210 PREPARATION & GROUNDWORK

1 GENERAL

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

- footings and floor slabs
- backfilling behind basement retaining walls

Documents

1.1 DOCUMENTS

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

NZS 3604	Timber-framed buildings
WorkSafe	Good Practice Guidelines - Excavation Safety

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details;

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

1.3 SITE SAFETY

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

1.4 ARCHAEOLOGICAL DISCOVERY

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



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2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

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

2.2 VOLCANIC TUFF FILL

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

2.3 ROCK FILL

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

2.4 SAND FILL

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

2.5 HARD FILL

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

2.6 GRANULAR FILL

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

2.7 DRESSING COURSE

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

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

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3 EXECUTION

3.1 WASHOUT BAY FOR TRUCK

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

3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

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

3.5 PROTECT EXISTING TREES, PLANTING, OR LANDSCAPE FEATURES

Protect from damage trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained. Ensure existing levels are undisturbed beneath the dripline of retained trees.

3.6 EROSION CONTROL

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

3.7 SURFACE PREPARATION

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

3.8 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove old foundations, slabs, drainage pipes, manholes, tanks, cables and redundant services. Report for instructions when any unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.

3.9 STOCKPILE TOPSOIL

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

3.10 SHORING AND UNDERPINNING

Carry out shoring and underpinning shown on the drawings and as necessary to prevent subsidence of adjoining public or private property and to ensure the safety of the public and site personnel. Maintain protection throughout the progress of the works, or until foundations and subgrade structures have been completed and the stability of adjoining public and private property secured.

3.11 GENERAL EXCAVATION

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

3.12 ROCK EXCAVATION

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

3.13 FOUNDATION EXCAVATION

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

3.14 INADEQUATE BEARING

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

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



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If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.
Confirm any changes with the territorial authority.
For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

3.15 STANDARD OF COMPACTION

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

3.16 GRANULAR BASE FOR SLABS

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

3.17 GENERAL BACKFILLING

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

3.18 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200mm layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing are not damaged.

3.19 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

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3101 CONCRETE WORK - BASIC

1 GENERAL

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

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

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

ACRS web site - www.steelcertification.com

Documents

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E2/AS3	External moisture provisions for concrete and concrete masonry buildings
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Contractor to supply

Manufacturer/supplier contact details

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Requirements

1.5 QUALIFICATIONS

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

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1.6 STEEL REINFORCING COMPLIANCE

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

2 PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

2.2 PRESCRIBED MIX CONCRETE

Prescribed mix concrete 17.5, 20 or 25 MPa grade (refer to SELECTIONS) minimum strength, using either separate batching of sand and builder's mix or coarse aggregate to NZS 3104, table 3.1, Grading recommendations for combined and uncombined coarse aggregates.

2.3 SITE CONCRETE

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

2.4 MASS CONCRETE

Concrete having a minimum strength of 10 MPa at 28 days

2.5 REINFORCEMENT

Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671, and 500E mesh to AS/NZS 4671.

2.6 MESH FOR SLABS TO NZS 3604 OR NZS 4229

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

2.7 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.8 SPACERS AND CHAIRS

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

2.9 DAMP-PROOF MEMBRANE

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

2.10 CELLULAR POLYSTYRENE INSULATION

Proprietary expanded polystyrene (EPS) foam board to AS 1366.3.

Accessories

2.11 WATERPROOFING FOR EXTERIOR OPENINGS

Unreinforced wet area membrane to AS/NZS 4858 for waterproofing around openings for windows, doors, meters and other services openings, at or above floor level, also parapets and ends of masonry walls abutting other claddings to CCANZ CP 01. Refer to SELECTIONS.

Do not use bituminous coatings.



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3 EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 OVER EXCAVATION

Contact the contract administrator for direction if more than minor over excavation below designed for founding levels is required.

3.3 FALSEWORK AND FORMWORK

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

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

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

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

3.4 INSTALL DAMP-PROOF MEMBRANE

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

3.5 INSTALL CELLULAR POLYSTYRENE INSULATION

Install EPS insulation system to manufacturer's requirements.

3.6 CUT AND BEND REINFORCEMENT

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

3.7 ADJUSTMENTS

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

3.8 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.9 SECURE REINFORCEMENT

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

3.10 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.
Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.11 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

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For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.12 REINFORCEMENT COVER TO NZS 3101.1

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, **Minimum required cover for a specified intended life of 50 years**. Sub-soil cover to NZS 3101.1, to suit soil and groundwater conditions. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.

3.13 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

For in-situ concrete, foundations and interior slabs on ground, to NZS 3604 or NZS 4229, the reinforcement and welded mesh cover to be:

Location, cover to	NZS 3604	NZS 4229
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

3.14 EQUIPOTENTIAL BONDING REINFORCING

Co-ordinate with electrician to provide for equipotential bonding of reinforcing as required by AS/NZS 3000, 5.6 Equipotential Bonding, before concrete placement.

3.15 CASTING IN

Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.16 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with NZS 3109, 5.6, Type B.

3.17 PRE-PLACEMENT INSPECTION

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

3.18 SURFACE FINISHES

To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.19 EXPOSED CONCRETE

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

3.20 CONCRETE SURFACE TOLERANCES

To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

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3.21 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.22 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.23 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3.

Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 2.3 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 24m centres to NZBC B1/AS1, paragraph 2.3.7.6 **NZS 3604 New clause**.

3.24 FLOOR SLABS TO NZS 4229

Generally for slabs on ground to NZS 4229 as modified by NZBC B1/AS1 and NZBC E2/AS3.

Construct to NZS 4229, 6, **Footings** and NZS 4229, 7, **Foundation walls and concrete slab-on-ground** as modified by NZBC B1/AS1, 2.1 **Masonry**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 18m centres to NZS 4229, 7.8.5.3 **Free joints**.

3.25 SAW CUTS TO NZS 3604 OR NZS 4229

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

3.26 SAW CUTS

Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring.

3.27 SPACING OF SAW CUTS

Spacing of sawcuts

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

3.28 SURFACE DEFECTS

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

3.29 CURING OF CONCRETE

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

3.30 STRIKE FORMWORK

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

12 hours: Sides of beams, walls and columns

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4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.31 WATERPROOFING EXTERIOR OPENINGS

Apply waterproofing to the exposed face of openings for, windows, doors, meters etc, also if necessary the top of parapets/balustrades and ends of masonry walls abutting other claddings. To CCANZ CP 01, waterproofing manufacturer's requirements and as detailed.

Provide temporary protection from direct sunlight.

3.32 CLEAN OUT

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

3.33 REMOVE

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

4 SELECTIONS

4.1 DAMP-PROOF MEMBRANE

Brand/type:	Refer to 'Kingspan Thermakraft Underlays, Foils, DPC, DPM & Tapes'

4.2 CELLULAR POLYSTYRENE INSULATION

Brand:	~
Grade:	S grade
Thickness:	~mm

4.3 REINFORCEMENT LAPS

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

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

4.4 NORMAL CONCRETE

Normal concrete:

17.5 MPa:	for reinforced cooncrete

4.5 PRESCRIBED MIX CONCRETE

Prescribed mix concrete:

10 MPa:	Site concrete, bedding concrete and for setting posts
17.5 MPa:	As required by NZS 3604
25 MPa:	As required by NZS 3604 and for exposed concrete in sea spray zone

4.6 SURFACE FINISHES FLOOR SLABS

Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U3	Refer to Architectural Plans

4.7 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

Surface finish class to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U2 wood float finish	Refer to Architectural Plans

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4.8 WATERPROOFING FOR EXTERIOR OPENINGS

Location:	Refer to Architectural Plans
Brand/name:	Contractor to confirm
Type:	Quick curing elastomeric unreinforced waterproofing membrane to AS/NZS 4858

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3155MR MAXRAFT® FLOOR SYSTEM

1 GENERAL

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

- MAXSlab®
- MAXRaft®
- MAXRaft® Plus+
- MAX85®
- MAXEdge®

1.1 RELATED WORK

Refer to 2221 REMOVING VEGETATION for clearing site.

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

EPS	Expanded Polystyrene

Documents

1.3 DOCUMENTS

ocuments referred to in this section are:

NZBC B1/VM1	Structural design of buildings
NZBC B1/AS1	Structural provisions for buildings
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4431	Engineered fill construction for lightweight structures
AS/NZS 4671	Steel reinforcing materials

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

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BPIR MAXSlab

Manufacturer/supplier contact details
Company: MBSS Limited
Trading as: MAXRaft®
Web: www.maxraft.co.nz
Email: hello@maxraft.co.nz
Telephone: 0800 MAXRAFT (629 723)

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For Pre-coated MAXEdge®

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Quality control and assurance

1.9 STEEL REINFORCING COMPLIANCE

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

1.10 INSPECTIONS

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

1.11 POST-CUT INSPECTION

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

2 PRODUCTS

MAXRaft® Systems

2.1 MAXSLAB®

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

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2.2 MAXRAFT®

MAXRaft® 320/340/400/420mm thick insulated concrete waffle floor system with 50mm VH EPS under thickenings and ribs. Suitable for ground that is <100kPa, has expansive clays or classified as TC2.

2.3 MAXEDGE®

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

Materials

2.4 BLINDING

25mm compacted GAP 7. Refer to 2242 BACKFILLING.

2.5 TIMBER FORMWORK

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

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

2.6 DAMP-PROOF MEMBRANE

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

2.7 POLYSTYRENE SHEETS - MAXSLAB®

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

2.8 POLYSTYRENE PODS - MAXRAFT® & MAX85®

MAXRaft® and MAX85® purpose made, NZ made, CFC free, expanded polystyrene (EPS) waffle pods.

2.9 POLYSTYRENE EDGE INSULATION - MAXEDGE®

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

2.10 POLYSTYRENE INTERNAL CONCRETE FOOTING INSULATION

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

2.11 REINFORCEMENT

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

2.12 INTERNAL CORNER REINFORCEMENT

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

2.13 MESH

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

2.14 CONCRETE

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

Components

2.15 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.16 BAR CHAIRS

MAXRaft® proprietary barchairs.

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2.17 POLYCOTE WANZ BAR - SLAB EDGE REBATE

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

2.18 KAPO BOARD - SLAB EDGE

Kapo Board is 6mm thick, medium density, non-combustible, calcium silicate board. Made of woven mesh and non-toxic minerals. It can be uncoated or pre-coated with acrylic paint.

Finish

2.19 PLASTER - SLAB EDGE

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.4 SITE CLEARANCE

Refer to 2221 REMOVING VEGETATION.

3.5 BUILDING PLATFORM

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

3.6 TEMPORARY BUILDING PLATFORM DRAINAGE

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

3.7 HARDFILL

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

3.8 UNDERGROUND SERVICES

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

3.9 BLINDING LAYER

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

3.10 FORMWORK

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



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3.11 INSTALL DAMP-PROOF MEMBRANE

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

3.12 PLACE POLYSTYRENE - MAXEDGE®

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

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

3.13 PROTECT - PRE-COATED MAXEDGE®

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

3.14 INSTALL BARCHAIRS

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

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

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

3.15 PLACE REINFORCING STEEL

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

3.16 LAPPED SPLICES

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

3.17 PLACE REINFORCING MESH AND CHAIRS

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

3.18 MESH LAPS

To NZS 3604 or NZS 4229. Welded reinforcing mesh to be lapped and tied, such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.19 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings.

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

3.20 TOPPING SLAB DEPTH

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



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3.21 EQUIPOTENTIAL BONDING REINFORCING

Co-ordinate with electrician to provide for equipotential bonding of reinforcing as required by AS/NZS 3000, 5.6 Equipotential Bonding, before concrete placement.

3.22 CONCRETE PLACEMENT AND COMPACTION

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

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

3.23 CONCRETE FINISHING

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

3.24 CONCRETE CURING

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

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

3.25 SHRINKAGE CONTROL JOINTS

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

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

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

3.26 PRE-COATED MAXEDGE® - TOUCH UP

Repair imperfections with Pre-coat Touch up.

3.27 PRE-COATED MAXEDGE® - PAINT

Refer to appropriate PAINTING section.

3.28 UNCOATED MAXEDGE® - PLASTER & PAINT

Refer to appropriate plastering and painting sections.

3.29 PAINT UNCOATED KAPO BOARD

Refer to appropriate PAINTING section.

3.30 UNCOATED MAXEDGE® - INSTALL KAPO BOARD

Apply adhesive to fix Kapo Board to MAXEdge®.

3.31 REBATE FINISHING

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

3.32 STRIKE FORMWORK

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



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3.33 SURFACE DEFECTS

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

3.34 CLEAN OUT SHRINKAGE CONTROL JOINTS

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

3.35 WATERPROOFING EXTERIOR OPENINGS

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

Completion & Commissioning

3.36 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 DAMP-PROOF MEMBRANE

Type:	Polythene
Brand:	Refer to '4161T Kingspan Thermakraft Underlays, Foils, DPC, DPM, & Tapes'

4.2 MAXSLAB®

Brand:	MAXSlab®
Overall depth:	Refer to Engineers Drawings
Slab thickness:	Refer to Engineers Drawings
Edge:	MAXEdge® - VH EPS insulation
Construction R-value:	R~ - determined in accordance with NZBC H1/VM1 Appendix E

4.3 UNCOATED MAXEDGE® - PLASTERED AND PAINTED

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	Standard heights of 300/305/320/340/400/420mm. Standard base width for MAXRaft® of 350mm and for MAXSlab® of 500mm. Length, width and height can be adjusted.
Finish:	Plaster and then paint. Refer to appropriate PLASTER and PAINTING section.

4.4 PRE-COATED MAXEDGE®

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	Standard heights of 300/305/320/340/400/420mm. Standard base width for MAXRaft® of 350mm and for MAXSlab® of 500mm. Length, width and height can be adjusted.
Finish:	Refer to appropriate PAINTING section.

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4.5 SLAB EDGE REBATE - POLYCOTE WANZ BAR

Location:	Refer to Architectural Plans
Size:	20mm cavity system
Finish:	Acrylic Paint.

4.6 CONCRETE SURFACE FINISH

Location:	Refer to Architectural Plans
Finish class:	U3 (interior)

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3410 STRUCTURAL STEEL

1 GENERAL

This section relates to the fabrication, erection and specialist coating of structural steelwork of a general nature, for Construction Category CC1 or CC2 (to AS/NZS 5131).

Refer to SELECTIONS for project Construction Category.

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

1.3 DOCUMENTS

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

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

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

1.4 MANUFACTURER DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Requirements

1.5 QUALIFICATIONS

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

1.6 TOLERANCES

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

1.7 SHOP DRAWINGS

Generally to AS/NZS 5131, 4.4.

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

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

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

Submit shop drawings for review.

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

1.8 VERIFY DETAILS AND DIMENSIONS

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

1.9 TESTS

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

- Welds: Non-destructive examinations (NDE)

1.10 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

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Architecturally Exposed Structural Steelwork (AESS)

1.11 AESS - SEPARATE SECTION

Refer to the separate section 3415 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL for additional requirements of AESS, which are to be read in conjunction with this section.



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2 PRODUCTS

2.1 STRUCTURAL STEEL

Comply with New Zealand, Australian, British or Japanese Standards for steel as required by NZS 3404.1, section 2, including, type, category, and suppression of brittle fracture. Also to AS/NZS 5131, Section 5.

Steel members and sections steel grade table

Component	Conforming to	Grade
Hot rolled steel sections	AS/NZS 3679.1	300; 350; 300L0; 300S0; 350L0, 300L15; 350L15
Plates and flats	AS/NZS 3678; AS/NZS 1594;	250; 300; 350; 400; 450; WR350; 250L0, 300L0; 350L0; 300L15; 350L15
Plates and flats	AS/NZS 1594; TS 102	HA250; HA300; HA350; HA400; HW350
Circular hollow sections	AS/NZS 1163; TS 102	C250L0; C350L0; C450L0
Square hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Rectangular hollow sections	AS/NZS 1163; TS 102	C350L0; C450L0
Welded beams and columns	AS/NZS 3679.2; TS 102	300; 400
Quench & tempered plate	AS 3597	500; 600; 700; 900; 1000
Purlins and girts	AS 1397	G250; G300; G350; G450; G500; G550, Z350, Z450

2.2 WELDING CONSUMABLES

To comply with and be selected for grade of steel being welded as required by AS/NZS 1554 series of standards.

2.3 FLUX

Welding flux to be dry and from sealed containers.

2.4 BOLTS, NUTS AND WASHERS

Grade 4.6, screws AS 1111.2 and bolts to AS 1111.1. Grade 4.6 nuts to comply with AS 1112.1. Property Class 8.8 bolts and equivalent nuts and washers (high strength structural quality only) to comply with AS/NZS 1252.1. Hot-dip galvanize to AS/NZS 4680 (and AS/NZS 1214), bolts, nuts and washers forming a permanent part of a structure subject to a protective coating.

Bolt Categories and tensioning

Bolting category	Bolt standard	Property Class	Tension method	Tensioned joint type
4.6/S	AS 1111.1	4.6	Snug tight	
8.8/S	AS/NZS 1252.1	8.8	Snug tight	
8.8/TB	AS/NZS 1252.1	8.8	Full tension	Bearing
8.8/TF	AS/NZS 1252.1	8.8	Full tension	Friction

In bearing type connections where the thread position relative to the shear plane is to be controlled.
N - threads included in shear plane
X - threads excluded from shear plane
F - friction type joints - prepare faying surfaces

2.5 GROUT

To AS/NZS 5131, 5.8.

2.6 CORROSION PROTECTION - HOT DIP GALVANIZED

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Hot dip galvanizing to AS/NZS 2312.2.

2.7 CORRISION PROTECTION - THERMAL METAL SPRAY

Themal metal spray coatings to AS/NZS 2312.3.

3 EXECUTION

Preparation, assembly and Fabrication

3.1 GENERALLY

To AS/NZS 5131, Section 6.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.3 ROUTINE MATTERS

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

3.4 SURFACE FINISH

Grind off all burrs and sharp arrises.

3.5 CUTTING

To AS/NZS 5131, Section 6.5.

3.6 HOLING

To AS/NZS 5131, Section 6.7

Do not use slotted holes for connections, other than those documented.

3.7 TEMPORARY MEMBERS FOR GALVANIZED ELEMENTS

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

Welding

3.8 WELDING GENERALLY

To AS/NZS 5131, Section 7 and AS/NZS 1554.1. Equipment to comply with AS/NZS 1554.1, clause 1.8.2.

Site weld only when correct alignment and preset or camber have been achieved.
Weld types as documented elsewhere or on drawings
Weld categories not documented elsewhere or on drawings to be Category GP.

3.9 NON-DESTRUCTIVE WELD EXAMINATION

Non-destructive weld examination (NDE) to AS/NZS 5131, clause 13.6.2 and AS/NZS 5131 Appendix I, Inspection of Welding and Bolting (New Zealand Only).

If non-visual NDE is required, use a third party testing authority.
Repair any welds revealed as faulty by NDE and repeat the examination.

3.10 WELDING GALVANIZED STEEL

When welding already Galvanized steel either:

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

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

Mechanical fastening

3.11 MECHANICAL FASTENING GENERALLY

To AS/NZS 5131.

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Connection contact surfaces to AS/NZS5131, 8.4.1.
Category 8.8/TF bolting to be clean, as rolled and free from applied finishes.
For washers, place one washer under the part rotated during tightening process (nut or bolt head).
Permanent bolt only when correct alignment and preset or camber have been achieved.

3.12 TENSIONING BOLTS

For tensioning of bolting categories 8.8/TB and 8.8/TF, use part-turn method or a direct tension indicator device. Ensure clear thread run out beneath the nut after tensioning is to New Zealand requirement of AS/NZS 5131, 8.2.2.

3.13 THREADS EXCLUDED FROM SHEAR PLANE

Select length of bolts such that the threaded portion does not occur within the shear plane between joined parts.

Erection of structural steel

3.14 ERECTION GENERALLY

To AS/NZS 5131, Section 11.

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

3.15 BOLTS AND ANCHORAGES

For each group of anchor bolts, provide a template with set-out lines clearly marked for positioning the bolts when casting in.

Start erection only when the holding down bolts and anchorages have been cast-in-place long enough to achieve sufficient strength.

3.16 TEMPORARY WORK

Provide temporary bracing, propping and restraint as required to make structure safe. Fix any temporary members so as not to weaken or deface permanent steelwork. Leave temporary bracing and restraint in place until the erection is sufficiently advanced to allow safe removal of temporary bracing.

3.17 SITE WORK

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

3.18 GROUTING SUPPORTS

Before grouting steelwork supported by concrete or masonry, set steelwork on packing or wedges as follows:

- Permanent packing or wedges - Form with solid steel or grout of similar strength to the permanent grout.
- Temporary packing or wedges - Remove before completion of grouting.

Grout at supports before constructing supported floors, walls and roofing.
Do not grout if the base plate or the footing surface temperature are outside the range 3°C to 35°C or to manufacturer's requirements.
Fill the space beneath the base plate with grout, if necessary hammered in tight to ensure complete filling of space.

3.19 DRIFTING

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

Finishing - galvanizing

3.20 GALVANIZING

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

3.21 STEELWORK BEING GALVANIZED

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

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

3.22 REPAIR WELD DAMAGED GALVANIZING

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

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

Finishing - thermal metal spray

3.23 THERMAL METAL SPRAY

Refer to the separate section 6782 METAL SPRAY CORROSION PROTECTION for metal spray requirements.

3.24 STEELWORK BEING THERMAL METAL SPRAYED

To AS/NZS 2312.3.

- Mask areas not to be coated prior to blasting and spraying.
- Abrasive blast clean steel surfaces to be sprayed with zinc or zinc alloy thermal metal spray to AS 1627.4 class 2½, to produce a sharp angular profile 65-100µm.
- Abrasive blast clean steel surfaces to be sprayed with aluminium or aluminium alloy thermal metal spray to AS 1627.4 class 3, to produce a sharp angular profile 75-100µm.
- Apply spray coating to dry surfaces, before discoloration and within 8 hours of surface preparation.
- Brush or vacuum surface so completely free of loose particles and dust.
- For application, steel temperature to be 3°C minimum above dew point and when air temperature is below 5°C.
- Apply thermal spray coating uniformly over the entire surface. Apply coating in multiple overlapping layers.
- Where sealing is specified, sealer to be applied as soon as possible after metal spraying.
- Where sanding is required to denib or reduce surface roughness, this to be carried out after the application of a sealer coat.

Finished dry film thickness to AS/NZS 2312.3, Table 2 Recommended values for the nominal thickness of the metallic coatings in microns - Life to first maintenance >25 years, for the specified corrosivity category.

3.25 REPAIR WELD DAMAGED THERMAL SPRAY

All repairs to AS/NZS 2312.3, section 9, Repair of thermal sprayed coatings.

- Damage to zinc or zinc alloy thermal metal spray up to 10cm² but less than 10mm wide, repair by mechanical cleaning to equivalent of Sa 2½ to AS 1627.4 and apply zinc rich paint conforming to AS/NZS 3750.9
- Damage to zinc areas greater than 10cm² and any damage to aluminium thermal metal spray should be re-prepared forming a feathered edge onto sound metal by spot blasting to original cleanliness & blast profile, then finish with metal thermal spray to match original.

Finishing - preparation

3.26 ENCASED STEELWORK

Clean the steelwork to be encased in concrete to remove all loose mill scale, rust, dirt and other matter affecting bond with concrete. Achieve this by wire brushing and the use of suitable solvents.

3.27 POWER TOOL CLEANING

To AS/NZS 5131, Section 9.

Remove oil and grease by the use of solvents. Scrape, wire brush and power tool clean to a minimum Class 2 finish to AS 1627.9. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

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3.28 ABRASIVE BLASTING

To AS/NZS 5131, Section 9.

Remove oil and grease by the use of solvents. Abrasive blast clean to a Class 2.5 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

Finishing - paint and protective coatings

3.29 PROTECTIVE COATINGS

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

3.30 PAINTING

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

3.31 UNPAINTED SURFACES

Do not paint:

- faying face of high strength friction grip bolted joints
- areas for site welding, keeping 75mm clear all round
- surfaces being embedded in concrete.

Where steel is only partly encased then extend priming 50mm minimum into the concrete encasement area.

3.32 PRIMING GENERALLY

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

3.33 PATCH PRIMING

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

3.34 COATING SYSTEMS

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

3.35 TOUCH-UP

Touch up primer. Apply protective coatings as specified.

Completion & Commissioning

3.36 COMPLETION MATTERS

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

4 SELECTIONS

Finishing - galvanizing

4.1 STEELWORK BEING GALVANIZED

Refer to Engineers Drawings

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Finishing - preparation

4.2 STEEL PREPARATION

Item:	Refer to Engineers Drawings
Preparation:	Engineer to Confirm

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3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES

1 GENERAL

This section relates to the supply and installation of MiTek New Zealand Limited prefabricated timber trusses.

1.1 RELATED WORK

Refer to 3821M MITEK TIMBER FRAMING for general timber framing, bracing, lintels, beams etc.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

DPC	Damp proof course

Documents

1.3 DOCUMENTS

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

NZBC B1/VM1	Structural design of buildings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
MiTek® (GANG-NAIL®) Roof Truss System Residential Manual (March 2024)
MiTek® (GANG-NAIL®) XPOTRUSS Roof Truss System (September 2002)
MiTek® (GANG-NAIL®) Posi-STRUT™ Design Manual (April 2019)
MiTek® Structural Fixings On-Site Guide (2024 Edition)

Manufacturer/supplier contact details

Company:	MiTek New Zealand Limited
Web:	www.miteknz.co.nz
Email:	design.miteknz@mii.com
Telephone:	0800 4 64835

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Post fabrication truss layout including fixings and lateral support
- Manufacturing statement issued by the fabricator identifying the trusses have been manufactured in accordance with the design statement and buildable truss layout
- Other information required by the BCA in the Building Consent Approval documents.

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Compliance Information

1.8 COMPLIANCE - PRODUCER STATEMENT DESIGN

Accredited MiTek fabricator's Buildable Truss Layouts prefabricated timber truss systems are designed to NZBC B1/VM1 using MiTek® 20/20 and MiTek Sapphire® certified design software.

1.9 SHOP DRAWINGS

Provide drawings showing the trusses and their layout;

- one prior to fabrication (buildable truss layout) for consent purposes.
- one post fabrication As Built (as fabricated layout) for construction and code compliance purposes.

The drawing shall be identified as 'Buildable' or 'As Built' (as fabricated) and shall include the following:

- The name and contact details of the accredited fabricator
- The job/design reference name or number
- The site address/location

Site specific structural and loading information including

- Pitch
- Cladding type
- Wind and snow loading values
- Date drawn
- A truss layout with truss labels and dimensions to locate the trusses on the supporting structure
- Identification of all load bearing walls/beams used to support trusses
- Specification and location of truss to truss and truss to top plate fixings or notification that such items are specified by others
- Identification of the location of any resulting loads where the design of the supporting member will be outside the scope of NZS 3604 (point loaded lintels and point loads on internal walls where the downward and upward loads are higher than 16kN) and where appropriate, any slab thickening required
- Reference to the Fabricator Design Statement

1.10 AS BUILT DOCUMENTS

Refer to the general section 1238 AS BUILT DOCUMENTATION for the requirements for submission and review of as built documents and records.

Provide the following as built documents and records:

- Provide final post fabrication as built information for construction and code compliance purposes. .

2 PRODUCTS

Materials

2.1 MITEK PREFABRICATED TIMBER TRUSSES

Prefabricated and precambered timber trusses from structural grade timber to NZS 3603, with 18% maximum moisture content to NZS 3602, treated to NZS 3640, jointed with proprietary GANG-NAIL components and marked with identification labels by accredited fabricators as required by NZS 3604.

Components

Accessories

2.2 MITEK GANG-NAIL TOOTHED CONNECTOR PLATES

Toothed connector plate. Available 1.0mm and 1.6mm thick G300 grade Z275 zinc coated steel, and 1.2mm thick 304 grade stainless steel. Refer to SELECTIONS.

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2.3 LUMBERLOK TIMBER CONNECTORS

Timber connection hardware including joist hangers, ceiling ties, cyclone ties, multigrips, cleats, and nailon plates. Available in zinc coated, hot dip galvanized or stainless steel.

2.4 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber:	18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install and fix trusses plumb and true to line and face without overstressing or deformation to accredited MiTek fabricator's Buildable Truss Layout and design statement, MiTek New Zealand Limited installation instructions, and NZS 3604 Section 10.2.2 Roof Trusses.

3.6 INSTALLATION ROOF TRUSSES

Lift and place first truss onto supporting structure and temporarily brace with a prop to a rigid element (e.g. wall or ground). Place each successive truss using a gauging rod set to the required spacing. Longitudinally brace trusses back to the first truss with a temporary timber tie nailed at each top chord panel point. Fix trusses to the supporting structure to buildable truss layout design requirements.

3.7 ROOF BRACING

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

3.8 SEPARATION

Lay DPC between all timber frames and concrete, where applicable, in a single layer with 50mm overlaps at joints.

Completion & Commissioning

3.9 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 MITEK (GANG-NAIL) ROOF TRUSSES

Location:	Refer to Architectural Plans & Truss Design Documentation
Brand/type:	**MiTek® (GANG-NAIL®) timber roof trusses**
Species:	Radiata pine (gauged)
Moisture content:	20% maximum
Treatment:	H1.2
Connector finish:	Galvanized - Refer to Truss Design Documentation
End connectors:	LUMBERLOK® - Refer to Truss Design Documentation

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3820 CARPENTRY

1 GENERAL

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

1.1 RELATED WORK

Refer to Architectural Plans

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Contractor to supply

Manufacturer/supplier contact details

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

1.5 QUALIFICATIONS

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

1.6 DIMENSIONS

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

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2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

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

2.2 LAMINATED TIMBER

Radiata pine laminations to AS/NZS 1328.1; treated as required by NZS 3602, NZBC B2/AS1, to the requirements of NZBC B2/AS1, AS/NZS 1604.1, NZS 3640, with special attention to Appendix B "Specification advisory notes". Supply weather resistant sealed.

2.3 ENGINEERED WOOD

LVL members to AS/NZS 4357.0, to required sizes and lengths and the manufacturer design properties.

Treatment to NZS 3640 and AS/NZS 1604.1.

2.4 TIMBER TRUSSES

To FTMA CoP. Moisture content 16% at supply.

2.5 WALL DWANGS, NOGS AND BLOCKING

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

2.6 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 or H3.2 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.7 EXTERIOR CAVITY WALL BATTENS - PROPRIETARY - NON-STRUCTURAL

Extruded polypropylene battens, size approximately 45mm wide x 18mm thickness. Temporary fix battens before being fixed into the framing with the cladding fixings. To the scope limitations of NZBC E2/AS1, and NZS 3604 Building Wind Zones up to, and including "Extra High".

Components

2.8 NAILS

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

2.9 SCREWS

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

2.10 BOLTS AND COACH SCREWS

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

2.11 NAIL PLATES

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

2.12 CONNECTORS

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

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2.13 CORROSION RISKS

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

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

2.14 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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3 EXECUTION

3.1 EXECUTION GENERALLY

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

3.2 SEPARATION

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

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

3.3 ATTENDANCE

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

3.4 MOISTURE CONTENT

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

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

3.5 SET-OUT

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

3.6 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8, **Walls**.

3.7 FRAMING ROOFS

Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.

3.8 FRAMING CEILINGS

Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

3.9 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.10 FIT JAMB BATTENS

For walls with direct fix cladding, fit 20mm (nominal) jamb battens over the wall underlay, to the jambs of window and door rough openings, to NZBC E2/AS1, Figure 9.1.9.4: General window and door opening for direct fixed. Cut around sill flashings. Fix with 60 x 2.8 flat head galvanized nails at 300mm centres.

3.11 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to NZS 3604. Fit and fix related flashings. Make allowance for cladding control joints where required. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.12 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.13 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4 SELECTIONS

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4.1 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.2 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1
Proprietary - non structural:	Manufacturer ~	Type ~	Reference ~
Cavity closer:	Manufacturer ~	Type ~	Reference ~

4.3 ROOF FRAMING - RADIATA PINE

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

4.4 INTERIOR FRAMING - RADIATA PINE

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

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3827E ECOPLY® PLYWOOD BRACING SYSTEM

1 GENERAL

This section relates to the supply and installation of Carter Holt Harvey Plywood Limited Ecoply® structural plywood sheets for wall bracing elements.

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

CCA	Copper chrome arsenate
PF	Phenol formaldehyde

Documents

1.3 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
AS/NZS 1604.3:2012	Preservative-treated wood-based products - Plywood
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Ecoply® Specification and Installation Guide (September 2025)
Ecoply® Plywood for Structural Bracing and Ceiling Diaphragms Product Technical Statement and Building Product Information Sheet
Ecoply® Safety Data Sheets

Manufacturer/supplier contact details

Company:	Carter Holt Harvey Plywood Limited
Web:	www.chhply.co.nz
Email:	info@ecoply.co.nz
Telephone:	0800 326 759

Requirements

1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Performance

1.7 BRACING

Ecoply® Bracing Systems are tested and analysed using the BRANZ P21 test method for wall bracing elements referenced in NZS 3604 as an acceptable solution to NZBC B1/AS1.

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2 PRODUCTS

Materials

2.1 ECOPLY STRUCTURAL PLYWOOD

7mm, 9mm, or 12mm thick, square edge, synthetic phenolic (PF) resin Type A bonded timber veneer plywood sheets, manufactured to AS/NZS 2269.0, untreated or H3.2 CCA treated to AS/NZS 1604.3:2012. Stress grade F8/F8. Available in CD and DD surface appearance grades. Refer to SELECTIONS.

2.2 GIB STANDARD PLASTERBOARD

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

Components

2.3 NAILS

Refer to SELECTIONS.

2.4 GIB HANDIBRAC HOLD DOWN BRACKET

Galvanized steel bracket by MiTek New Zealand Ltd., supplied with 5 Tek screws and 2 BOWMAC screw bolts.

Accessories

2.5 TIMBER PRESERVATIVE TREATMENT

Soudal Metalex Concentrated Timber Preservative treatment, in clear or green colour. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Timber substrate: 18% maximum moisture content

Application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with Ecoply® Specification and Installation Guide.

3.6 BOTTOM PLATE FIXING

Fix GIB® HandiBrac® hold-down brackets at each end of bracing element with supplied fixing. Within the length the bracing element, fix bottom plates to the requirements of NZS 3604.

3.7 FIX STRUCTURAL PLYWOOD SHEETS

Orient long edge of plywood sheet vertically. Nail fix plywood to framing to the specific Ecoply nail pattern for the brace element. Finish nail heads flush. Allow 2mm expansion gap between sheets and maintain clearances to sheet edges to Ecoply requirements. Refer to Ecoply® Specification and Installation Guide.

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3.8 FIX GIB STANDARD PLASTERBOARD

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

3.9 TREAT CUT EDGES

Brush timber preservative onto cut edges and penetration cut outs of H3.2 CCA treated plywood sheets.

Completion

3.10 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 ECOPLY® STRUCTURAL PLYWOOD

Location:	Refer to drawings and bracing calculations
Manufacturer:	Carter Holt Harvey Plywood Ltd
Brand/grade:	Ecoply® DD or better A BOND
Stress grade:	F8
Thickness:	7mm
Treatment:	H3.2 CCA

4.2 FASTENERS

Type/size/material:	50 x 2.8mm flat head hot dipped galvanized or stainless steel annular grooved nails



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4161T KINGSPAN THERMAKRAFT UNDERLAYS, FOILS, DPC, DPM, & TAPES

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4347	Damp-proof courses and flashings - Methods of test
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
CodeMark CMNZ10002 ver5	Watergate Plus Wall Underlay
CodeMark CMNZ30028 verK	Thermakraft Covertek 407 Roof and Wall Underlay
CodeMark CMNZ30030 verJ	Thermakraft Covertek 405 Roof and Wall Underlay
CodeMark CMNZ30069 verI	Thermakraft Covertek 403 Roof and Wall Underlay

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Thermakraft's Product Data Sheets
Thermakraft's Installation Guides
BRANZ Appraisal 329 (2022) - Supercourse 500 Damp-Proof Course and Concealed Flashing - Amendment 29 August 2023
BRANZ Appraisal 651 (2024) - Thermakraft Covertek 407 Roof and Wall Underlay - Amended 13 July 2026
BRANZ Appraisal 695 (2023) - Watergate Plus Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 743(2025) - Thermakraft Covertek 405 Roof and Wall Underlay
BRANZ Appraisal 878 (2025) - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 912 (2021) - Thermakraft 220 Synthetic Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 917(2025) - Thermakraft Covertek 403 Roof and Wall Underlay

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

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Kingspan Thermakraft product range.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information - CodeMark certified

1.7 CODEMARK CERTIFICATE - THERMAKRAFT COVERTEK 405

Thermakraft Covertek 405 roof and wall underlay meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30030.

Compliance information - BRANZ appraised

1.8 BRANZ APPRAISED - THERMAKRAFT SUPERCOURSE 500

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

1.9 BRANZ APPRAISED - THERMAKRAFT COVERTEK 405

Thermakraft Covertek 405 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 743

1.10 BRANZ APPRAISED - THERMAKRAFT ALUBAND

Thermakraft Aluband flashing tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 878

1.11 BRANZ APPRAISED - THERMAKRAFT ONESEAL

Thermakraft OneSeal multi-fit pipe and cable penetration seal has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 942

1.12 BRANZ APPRAISED - THERMAKRAFT THERMABAR 397

Thermakraft Thermabar 397 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1000

1.13 BRANZ APPRAISED - THERMAKRAFT AUSNET

Thermakraft Ausnet wire netting has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1029

1.14 BRANZ APPRAISED - THERMAKRAFT THERMAFLASH

Thermakraft Thermaflash flashing tape has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1122

2 PRODUCTS

DPC

2.1 THERMAKRAFT SUPERCOURSE 500

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

2.2 THERMAKRAFT PERIMETER

Sand coated black paper DPC composed of cardboard, bitumen and fine sand. Tested to AS/NZS 4347 in accordance with AS/NZS 2904. Available in various width. Refer to SELECTIONS.

DPM

2.3 THERMAKRAFT THERMATHENE BLACK

0.25mm x 4000mm wide black DPM composed of recycled alloyed polythene. Membrane has a vapour flow resistance of at least 90MNs/g to NZS 3604 and NZS 4229, Damp-Proof Membranes. Refer to SELECTIONS.

Synthetic underlays - fire retardant

2.4 THERMAKRAFT COVERTEK 405

CodeMark certified and BRANZ appraised self-supporting synthetic roof and wall underlay, white with yellow logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤5. Available in 1250mm and 2550mm width. Refer to SELECTIONS.

Vapour control

2.5 THERMAKRAFT VAPOUR SHIELD

Woven synthetic sarking and moisture vapour barrier, coated both sides with a vapour impermeable film. One side is coated black and the reverse side white. Available in 2130mm width. Refer to SELECTIONS.

2.6 THERMAKRAFT CAVAP ALU 1500 UV-AC

Foil reinforced, self adhesive vapour barrier. Coated with an acrylic adhesive to underside and a removable protective film. 1500mm wide and 33.4m long rolls.

Components - sealing

2.7 THERMAKRAFT WHITE GENERAL PURPOSE TAPE

60mm wide, white polypropylene general purpose tape with acrylic adhesive. Refer to SELECTIONS.

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2.8 THERMAKRAFT PREMIUM JOINING TAPE

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

2.9 THERMAKRAFT ONESEAL

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

2.10 THERMAKRAFT CORNER MOULDS

Orange, flexible inert polythene moulded window corner flashing. Refer to SELECTIONS.

2.11 THERMAKRAFT THERMAFLASH

BRANZ appraised self-adhering synthetic flexible flashing tape, white on the top surface. Available in 75mm, 150mm and 200mm width. Refer to SELECTIONS.

2.12 THERMAKRAFT ALUBAND

BRANZ appraised, black, self-adhering polymeric faced bituminous flashing tape. Available in 75mm, 150mm and 200mm width. Refer to SELECTIONS.

Components - secure strapping/netting

2.13 THERMAKRAFT THERMASTRAP

19mm wide, rigid embossed polypropylene strap, colour blue. Refer to SELECTIONS.

2.14 THERMAKRAFT STUD STRAP

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

2.15 THERMAKRAFT AUSNET

BRANZ appraised 1mmØ x 2000mm wide galvanized steel hexagonal wire netting to AS/NZS 4534. Available in 50mm and 75mm mesh size. Refer to SELECTIONS.

2.16 THERMAKRAFT AUSMESH

2mmØ galvanized steel safety mesh to AS/NZS 4389, 150mm x 300mm mesh size. Available in 1800mm and 2400mm width.

Fixings

2.17 FIXINGS - TO TIMBER

Little grippers, staples, clouts or screws to suit application. Refer to SELECTIONS.

2.18 FIXINGS - TO STEEL

Construction grade double sided tape, adhesive or galvanized flat head screws to suit application. Refer to SELECTIONS.

2.19 FIXINGS - EARLY CLOSE

25mm cap nails. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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Installation/application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - DPC

3.5 INSTALL DPC

Ensure substrate's surface is smooth, flat and free from sharp ridges/projections that may puncture membrane. Install as a single layer with minimum 50mm overlap at joints to the Installation Guide.

Installation - DPM

3.6 INSTALL DPM - CONCRETE FLOOR

Install DPM over sand blinding below concrete floors, install in a neat fashion with a smooth surface as a single layer with minimum 150mm overlap at joints to the Installation Guide.

3.7 APPLY TAPE TO LAPPED DPM JOINTS

Ensure DPM is free of dust and contaminates, where required clean with a dry cloth. Apply tape to the Installation Guide centred over joint laps by firmly pressing down without stretching or pulling tape.

Installation - wall underlay

3.8 INSTALL WALL UNDERLAY

Install wall underlay to the Installation Guide horizontally and in true alignment over exterior face of wall framing including openings. Start by placing first sheet draw taut and fix at maximum 300mm centres to wall framing members. Install additional sheets in rows repeating the process for the first sheet with sheet end laps to be of at least 150mm and occurring over wall framing and overlapping higher over lower sheets by at least 150mm.

3.9 INSTALL WALL PENETRATION SEALS

Ensure wall underlay is free of dust and contaminates, where required clean with a dry cloth. Install penetration seal to the Installation Guide over pipe/conduit with a tight fit. Slide seal over pipe/conduit and place on underlay in a diamond shape. Remove backing release film and push firmly down to fix in place.

Installation - secure netting/strapping

3.10 INSTALL SECURE STRAPPING

Place straps on underlay, draw taut and fix to framing to the Installation Guide.

3.11 INSTALL WIRE NETTING

Install wire netting to the Installation Guide in the same direction as the underlay. Where required to facilitate water drainage install netting with a sag, otherwise draw taut. Tie edges of netting together with galvanized wire clips and fix in place.

3.12 INSTALL SAFETY MESH

Install safety mesh to the Installation Guide and AS/NZS 4389.

Installation - roof underlay

3.13 INSTALL ROOF UNDERLAY - HORIZONTAL

Install underlay to the Installation Guide horizontally and in true alignment over exterior face of roof framing. Place first sheet overlapping guttering (max. 20mm) or if eaves flashing is used terminate on the upper side of the flashing, draw sheet taut and fix at maximum 300mm centres to roof framing members. Install additional sheets in row repeating the process for the first sheet with sheet end laps to be of at least 150mm. Install sheets up to and over the ridge repeating the installation process for the first row and overlapping higher over lower sheets by at least 150mm.

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3.14 INSTALL ROOF UNDERLAY - VERTICAL

Install underlay to the Installation Guide vertically and in true alignment over exterior face of roof framing. Place first sheet up the slope to the ridge overlapping guttering (max. 20mm) or if eaves flashing is used terminate on the upper side of the flashing, draw sheet taut and fix at maximum 300mm centres to roof framing members. Install additional sheets repeating the process for the first sheet lapping joints by at least 150mm.

3.15 INSTALL RAINARMOR SELF ADHESIVE

Align membrane with edge of substrate, peel off the removable protective film gradually and press membrane firmly with a hand roller or plastic spreader. Apply 400mm wide strip centred on wall corners before laying sheets over. Lay upper sheets over lower sheets with minimum 150mm overlap. Penetrations and repair for small, damaged areas can be made with any Thermakraft window flashing tape or Premium Joining Tape. Larger damage can be repaired by installing a new layer over the top with a minimum of 150mm overlap on all sides. Limit UV and weather exposure to no more than 120 days.

Installation - vapour control layers

3.16 INSTALL VAPOUR CONTROL LAYER

Install vapour control layer to the Installation Guide in true alignment, overlap sheet joints by at least 150mm, draw sheets taut and fix at maximum 300mm centres to framing.

3.17 SEAL VAPOUR CONTROL LAYER

Ensure vapour layer is free of dust and contaminates, where required clean with a dry cloth. Apply tape to the Installation Guide over joint laps and over any other projections and penetrations by firmly pressing down without stretching or pulling.

3.18 INSTALL CAVAP ALU 1500 UV-AC

Foil reinforced, self-adhesive vapour barrier to be installed on the internal (warm) side of rigid substrates. Align membrane with edge of substrate, peel off the removable protective film gradually and press membrane firmly with a hand roller or plastic spreader. Seal penetrations with any Thermakraft window flashing tapes or Premium Joining Tape. Any minor damages can be repaired by installing a new layer over the top with a minimum of 150mm overlap on all sides. Limit UV and weather exposure to no more than 7 days.

Preparation of wall underlay for window/door placement

3.19 FORM OPENINGS

Form openings in wall underlay to the Installation Guide. Cut underlay diagonally from corner to corner across the opening and tightly fold underlay flaps into opening over the full depth. Secure underlay to the back face of opening framing with staples. Trim excess underlay off at internal face. Remove dust and contaminates from underlay with a dry cloth.

3.20 INSTALL CORNER MOULDS

Install corner moulds with tight fit to sill/jamb corners to the Installation Guide.

3.21 FLASHING TAPE APPLICATION - GENERALLY

Install flashing tape to the Installation Guide. Fold tape back onto exterior wall surface by at least 50mm, cover opening depth in full and finish by lining up with inside edge of opening framing. Fix tape by applying even pressure by hand or a roller leaving no air bubbles beneath the tape.

3.22 APPLY FLASHING TAPE ACROSS SILL/JAMB CORNERS

Cut 75mm wide tape to 100mm length. Apply to exterior wall surface across sill/jamb corners at 45°, overlap corners by 3mm.

3.23 APPLY FLASHING TAPE TO SILL

Use 150mm wide tape for up to 100mm deep opening framing and 200mm wide tape for deeper framing. Cut tape to sill length plus 400mm. Remove release film from tape, align back edge of tape with interior sill edge allowing for at least 200mm tape upstand at jambs, apply tape to sill and jamb. Cut tape overhang at external sill/jamb corners, fold back onto and apply to exterior wall face.

3.24 CREATE PENETRATION SELF-SEAL AT SILL

Cut 75mm wide flashing tape to sill length. Apply along entire length of sill at window/door fixing location to ensure fixing penetration self-seal.

3.25 APPLY FLASHING TAPE TO HEADER

Use 150mm wide tape for up to 100mm deep opening framing and 200mm wide tape for deeper framing. Cut tape to 400mm length. Remove release film from tape, align back edge of tape with interior opening framing edge and apply 200mm along head and 200mm down jambs. Cut tape overhang at external head/jamb corners, fold back onto and apply to exterior wall face.

3.26 APPLY FLASHING TAPE ACROSS HEAD/JAMB CORNERS

Cut 75mm wide tape to 100mm length. Apply to exterior wall surface across head/jamb corners at 45°, overlap corners by 3mm to create a seal at corner junctions.

Completion

3.27 COMPLETION MATTERS

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

4 SELECTIONS

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

DPC

4.1 DPC - THERMAKRAFT SUPERCOURSE 500

Location:	Refer to Architectural Plans
Manufacturer:	Thermakraft
Brand:	Supercourse 500
Type:	Damp proof course
Width:	Contractor to confirm

DPM

4.2 DPM - THERMAKRAFT THERMATHENE BLACK

Location:	Refer to Architectural Plans
Manufacturer:	Thermakraft
Brand:	Thermathene Black
Type:	Damp proof membrane
Width:	4000mm
Joint tape:	White General Purpose Tape

Synthetic underlays - fire retardant

4.3 ROOF & WALL UNDERLAY - THERMAKRAFT COVERTEK 405

Location:	Refer to Architectural Plans
Manufacturer:	Thermakraft
Brand:	Covertek 405
Type:	Synthetic roof and wall underlay
Width:	Contractor to confirm
Fixings:	Galvanized Little Grippers Galvanized 6mm-8mm staples Galvanized 20mm large head clouts

Components for sealing wall underlay penetrations

4.4 FLASHING TAPE - THERMAKRAFT THERMAFLASH

Location:	Refer to Architectural Plans
Manufacturer:	Thermakraft
Brand:	Thermaflash
Type:	Flashing tape
Width:	200mm and 150mm

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4.5 150MM FLASHING TAPE - THERMAKRAFT ALUBAND

Location:	Refer to Architectural Plans
Manufacturer:	Thermakraft
Brand:	Aluband
Type:	Flashing tape
Width:	200mm and 150mm

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4171E ECOPLY® BARRIER RIGID AIR BARRIER SYSTEM

1 GENERAL

This section relates to the supply and installation of Carter Holt Harvey Plywood Limited Ecoply® Barrier plywood as a rigid wall underlay and air barrier behind cavity wall cladding systems.

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

CCA	Copper chrome arsenate
PF	Phenol formaldehyde
uPVC	Unplasticized polyvinyl chloride

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other that risk group SH
AS/NZS 1604.3:2012	Preservative-treated wood-based products - Plywood
AS/NZS 2269.0	Plywood - structural - specifications
NZS 3604	Timber-framed buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide (June 2026)
Ecoply® Barrier Plywood Product Technical Statement and Building Product Information Sheet
Ecoply® Barrier Safety Data Sheet
Ecoply® Barrier sITe App
Ecoply® Barrier CAD drawings
BRANZ Appraisal 827 (2025) - Ecoply® Barrier Rigid Air Barrier

Manufacturer/supplier contact details

Company:	Carter Holt Harvey Plywood Limited
Web:	www.chhply.co.nz
Email:	info@ecoply.co.nz
Telephone:	0800 326 759

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information

1.7 COMPLIANCE - BRANZ APPRAISAL

Ecoply® Barrier Rigid Air Barrier has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 827.

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Performance

1.8 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External Cladding Systems or NZBC C/AS2, 5.5 External Cladding Systems, where external walls are located at a distance greater than or equal to 1.0m from a relevant boundary and a building height less than 10m.

2 PRODUCTS

Materials

2.1 ECOPLY BARRIER PLYWOOD

7mm thick, square edge, synthetic phenolic (PF) resin Type A bonded timber veneer plywood sheets, manufactured to AS/NZS 2269. H3.2 CCA treated to AS/NZS 1604.3:2012. Stress grade F8/F8. Appearance grade DD with water-resistant beige polyester powder coated on front face and four edges. Sheets marked Ecoply® Barrier. Sheets 1197mm wide. Available in 2440mm and 2745mm lengths. Refer to SELECTIONS.

2.2 GIB STANDARD PLASTERBOARD

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

Components

2.3 NAILS

Refer to SELECTIONS.

2.4 ECOPLY BARRIER SILL TAPE

Flexible weathertight tape with butyl rubber and polyethylene film carrier paper, siliconized foil release paper. 20m long roll. Available in 150mm and 200mm widths to suit application. Black colour.

2.5 ECOPLY BARRIER SEALING TAPE

Water-resistant tape with polypropylene fleece carrier paper and siliconized release paper. 25m long roll. Available in 60mm, 150mm, and 200mm widths to suit application. Grey colour.

2.6 GIB HANDIBRAC HOLD-DOWN BRACKET

Galvanized steel bracket by MiTek New Zealand Limited, supplied with 5 Tek screws and 2 BOWMAC screw bolts.

2.7 TIMBER PRESERVATIVE TREATMENT

Soudal Metalex Concentrated Timber Preservative treatment, in clear or green colour. Refer to SELECTIONS.

Accessories

2.8 PRO CLIMA KAFLEX CABLE SEALING GROMMET

EPDM backed, siliconized water-resistant self-adhesive grommet.

2.9 PRO CLIMA ROFLEX SEALING GROMMET

EPDM watertight grommet, size to suit penetration.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

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3.3 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

Timber substrate: 18% maximum moisture content

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide.

3.6 BOTTOM PLATE FIXING - BRACING SYSTEM

Fix GIB® HandiBrac® hold-down brackets at each end of bracing element with supplied fasteners. Within the length the bracing element, fix bottom plates to the requirements of NZS 3604.

3.7 TREAT CUTS

Brush timber preservative onto cut edges and penetration cut outs.

3.8 FIT ECOPLY BARRIER SHEETS

Fit Ecoply® Barrier sheets with long edge oriented vertically, beige polyester powder coated face outwards, and cut sheet ends oriented upward. Sheets to overhang the bottom plate, joist or bearer by a minimum of 25mm. Allow 2mm expansion gap between sheets.

3.9 FIX GIB STANDARD PLASTERBOARD - BRACING SYSTEM

Refer to 5113G GIB PLASTERBOARD LININGS for GIB® standard plasterboard.

3.10 FASTENERS - STANDARD NAILING PATTERN

Nail fix to framing to the standard Ecoply nail pattern. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface.

3.11 FASTENERS - NAILING PATTERN FOR BRACING SYSTEM

Nail fix to framing to the specific Ecoply nail pattern for the brace element. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface. Refer to Ecoply® Structural Rigid Air Barrier - Barrier Specification & Installation Guide.

3.12 FIXING TO RESIST UPLIFT

Nail fix the top of the sheet directly to the centre of the top plate using the specific Ecoply nail pattern for a 4.7kN fixing of the top plate to the studs. Fix the remainder of the sheet to standard nailing pattern. Horizontal sheet joints are not permitted within 300mm of top plate. Maintain clearances to sheet edges to Ecoply requirements. Finish fastener heads flush with the panel surface.

3.13 LINTEL CONNECTION FOR UPLIFT

Nail framing and Ecoply® Barrier sheets to Ecoply lintel connection detail for uplifts not exceeding 7.5kN.

3.14 TAPE - GENERAL

Remove dust from sheets before adhering tape. Apply pressure to seal the tapes with minimal wrinkles.

3.15 VERTICAL ECOPLY BARRIER SHEET JOINTS - WALL PLANE

Centre Ecoply® Barrier Sealing Tape over vertical sheet joints.

3.16 VERTICAL ECOPLY BARRIER SHEET JOINTS - CORNERS

Centre Ecoply® Barrier Sealing Tape over sheet joints at external and internal wall corners.

3.17 HORIZONTAL SHEET JOINT - TAPE Z FLASHING

Apply Ecoply® Barrier Sealing Tape over lower sheet with 60mm overlap to sheet and 80mm upstand to form a Z flashing. Fit upper Ecoply® Barrier sheet over tape upstand with a 15mm expansion gap between upper sheet edge and taped-over lower sheet edge.



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3.18 HORIZONTAL SHEET JOINT - FACE SEAL

Fit Ecoply® Barrier sheets with 5mm expansion gap between edges. Apply 150mm wide Ecoply® Barrier Sealing Tape to sheet face centred over sheet joint.

3.19 TAPE SPLICES & JOINTS

Where tape splices occur at a junction, create an overlapping splice of at least 50mm. Take special care to remove any wrinkles or voids at splice areas.

3.20 WINDOW & DOOR OPENINGS

Apply Ecoply® Barrier Sill Tape to cover the bottom of the opening and Ecoply® Barrier Sealing Tape to the vertical trimmer stud and lintel, reinforce corners at each end of the lintel with 100m strip of 150mm wide Ecoply® Barrier Sealing Tape.

3.21 PENETRATIONS - ECOPLY BARRIER SILL TAPE

Apply Ecoply® Barrier Sill Tape to flash to Ecoply® Barrier sheet, provide 100mm minimum cover to sheet. Bandage around pipes with Ecoply® Barrier Sealing Tape with 25mm minimum width of cover to pipe.

3.22 PENETRATIONS - PRO CLIMA KAFLEX CABLE SEALING GROMMET

Apply self-adhesive Pro Clima Kaflex Cable Sealing Grommet over cable penetration to Pro Clima installation instructions.

3.23 PENETRATIONS - PRO CLIMA ROFLEX SEALING GROMMET

Apply Pro Clima Roflex Grommet over penetration and seal grommet flange to Ecoply® Barrier sheets with Ecoply Barrier Sealing Tape to Pro Clima installation instructions.

3.24 FLASHINGS

Apply Ecoply® Barrier Sealing Tape over horizontal flashings as required.

Completion

3.25 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 ECOPLY® BARRIER PLYWOOD

Location:	Refer to Architectural Plans
Manufacturer:	Carter Holt Harvey Plywood Limited
Brand:	Ecoply® Barrier
Width:	1197mm
Length:	Contractor to confirm
Thickness:	7mm
Treatment:	H3.2 CCA

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4231HO JAMES HARDIE® OBLIQUE™ WEATHERBOARD CLADDING

1 GENERAL

This section relates to the supply and fixing of Oblique™ Weatherboard cladding.

1.1 RELATED WORK

Refer to Architectural Plans
Refer to painting section(s) for the protective coating required to meet the NZBC durability requirements.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FRR	Fire resistance rating

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E2/VM1	Cladding systems of buildings up to 10 m in height – including junctions with windows, doors and other penetrations
AS/NZS 1170.2:2011	Structural design actions - Wind loads
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
CodeMark™ CMNZ30147 - ver C	Oblique™ Weatherboard by James Hardie® Cavity Cladding System

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Oblique™ Weatherboard Horizontal Installation Technical Specification (March 2026)
Oblique™ Weatherboard Vertical Installation Technical Specification (March 2026)
Oblique™ Weatherboard Vertical Installation to Hardie™ 40mm Structural Horizontal Cavity Batten Technical Specification (March 2026)
Fire and Acoustic Design Manual by James Hardie, May 2026
James Hardie® Installation Checklist
BRANZ Appraisal 1231 (2022) - Oblique™ Weatherboard (Horizontal) Cavity Cladding - amended 31 March 2026
BRANZ Appraisal 1232 (2022) - Oblique™ Weatherboard (Vertical) Cavity Cladding - amended 31 March 2026
BRANZ Appraisal 1285 (2025) - James Hardie Fire And Acoustic Wall Systems - amended 16 June 2026

Manufacturer/supplier contact details

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

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

25 years	For Oblique™ Weatherboard products (refer to James Hardie® product warranty)
15 years	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 SAFE WORKING

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
Oblique™ Weatherboard Care and Maintenance guide.

Provide this information prior to practical completion.

1.10 OBLIQUE™ WEATHERBOARD INSTALLATION CHECKLIST

Installer to complete, sign and provide a James Hardie® Installation Checklist.

Compliance information

1.11 CODEMARK CERTIFICATE

James Hardie® Oblique™ Weatherboard meets the requirements of the NZBC when used within the Conditions and Limitations of its Certificate of conformity CMNZ30147.

Performance - wind

1.12 PERFORMANCE, WIND

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

Performance - fire

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIALS

James Hardie® Oblique™ Weatherboard cladding tested to AS/NZS 3837 and to specific requirements of C/AS1 or C/AS2 achieving Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

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2 PRODUCTS

Materials

2.1 OBLIQUE™ WEATHERBOARDS

Oblique™ Weatherboards, rusticated profile, 14mm thick, available in 200mm or 300mm widths and 3000mm or 4200mm lengths, pre-primed, manufactured to AS/NZS 2908.2 from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving. Tested to the requirements of NZBC E2/VM1 for weathertightness and complying with the NZBC.

2.2 RIGID AIR BARRIERS

Refer to section 4171HR JAMES HARDIE® RIGID AIR BARRIERS.

2.3 WALL UNDERLAY

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

2.4 TIMBER CAVITY BATTENS

Radiata pine battens, minimum 45mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.5 HARDIE™ 28MM ALUMINIUM CAVITY CLOSER

Perforated aluminium moulding, with upstands.

2.6 20MM VENT STRIP/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.7 HARDIE™ 14MM VERTICAL FLASHING STOP ALUMINIUM

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

2.8 HARDIE™ 14MM ALUMINIUM JAMB FLASHING

Aluminium moulding used beside window opening to end butt the Oblique™ Weatherboard.

2.9 HARDIE™ 14MM ALUMINIUM TRIMLINE JOINT FLASHING

Aluminium flashing extrusion used behind cladding joints.

2.10 TRIMLINE JOINTERS

Aluminium jointers to joint Oblique™ Trimline Joint Flashings at flashing ends, external corners and internal corners.

2.11 HARDIE™ 14MM ALUMINIUM EXTERNAL BOX CORNER

Anodised aluminium extrusion to flash behind cladding at external corners.

2.12 HARDIE™ AXENT™ TRIM

19mm thick pre-primed fibre cement trim.

2.13 FASTENER TYPE

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

Refer to NZBC E2/AS1, Table C.1.1.1A: Material selection, and NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

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

Check against SED requirements for microclimate conditions. For fastener type refer to following clause(s).

2.14 CAVITY BATTEN NAILS

40 x 2.8mm Hardie™ Flex nails for fixing timber cavity battens and aluminium flashings.

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2.15 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 65 x 2.87mm D head or 65 x 2.87mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over cavity battens over flexible underlay.

2.16 GRADE 316 STAINLESS STEEL NAILS

Grade 316 stainless, 65 x 2.87mm D head or 65 x 2.87mm RounDrive steel ring shank nails for fixing Oblique™ Weatherboards over cavity battens over flexible underlay.

2.17 HOT DIPPED GALVANIZED NAILS

Hot-dipped galvanized, 75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over battens over rigid air barrier.

2.18 GRADE 316 STAINLESS STEEL NAILS

Grade 316 stainless, 75 x 3.06mm D head or 75 x 3.15mm RounDrive ring shank nails for fixing Oblique™ Weatherboards over battens over rigid air barrier.

2.19 FLEXIBLE SEALANT

Bostik® Seal N Flex-1™ or Sikaflex® AT Facade or Sikaflex® MS sealants.

2.20 PRIMER

Refer to SELECTIONS.

2.21 EXTERIOR GRADE FILLER

CRC® ADOS® Builders Fill, two part filler to fill over nail holes.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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

Application - particular installations

3.4 FIRE RESISTANCE RATING

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

Application - generally

3.5 INSTALL CAVITY BATTENS - OBLIQUE™ HORIZONTAL WEATHERBOARDS

Install 20mm minimum thick cavity battens to NZBC E2/AS1, 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

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3.6 PENETRATIONS AND FLASHINGS

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

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

3.7 INSTALL OBLIQUE™ WEATHERBOARDS - HORIZONTAL INSTALLATION

Cut weatherboards to required lengths for vertical jointing. Prime site cut ends that are exposed prior to installation. Fit vertical jointers, internal and external corners and fix weatherboards as per Oblique™ Weatherboard Horizontal technical specifications.

Completion & Commissioning

3.8 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 JAMES HARDIE® OBLIQUE™ WEATHERBOARDS

Location:	Refer to Architectural Plans
Type/Brand:	Oblique™ Weatherboards
Thickness:	14mm
Width:	Contractor to confirm
Length:	Contractor to confirm
Construction:	Cavity fix
Fixing:	Contractor to confirm

4.2 TIMBER CAVITY BATTEN - FOR HORIZONTAL INSTALLATION

Timber species:	Radiata pine
Treatment:	H3.1
Thickness:	18mm

4.3 HARDIE™ 28MM ALUMINIUM CAVITY CLOSER

Location:	Refer to Architectural Plans
Type/Brand:	Hardie™ Aluminium Cavity Closure

Finishing

4.4 PAINTING

Refer to painting section(s) for details.

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4239JH JAMES HARDIE® SOFFITS

1 GENERAL

This section relates to the supply and fixing of James Hardie® soffit and eave linings.
It includes:

- James Hardie® Eclipsa™ Eaves Lining
- James Hardie® Hardie™ Flex Eaves Lining
- James Hardie® Hardie™ Groove Soffit Lining
- James Hardie® Villaboard™ Soffit Lining

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Eaves and Soffits Installation Manual by James Hardie® (Feb 2025)
Fire and Acoustic Design Manual by James Hardie, May 2025
James Hardie® Eclipsa™ Eaves Lining Product Technical Statement
James Hardie® Hardie™ Groove Lining Product Technical Statement
James Hardie® Villaboard™ Lining Product Technical Statement
James Hardie® Eaves and Soffit Care and Maintenance
BRANZ Appraisal 1285 (2025) - James Hardie Fire And Acoustic Wall Systems - Amended 16 June 2026

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For lining product and accessories

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.6 NO SUBSTITUTIONS

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:

James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 HARDIE™ FLEX EAVES LINING

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

Components

2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZBC E2/AS1, Table C.1.1.1A: Material selection, for fixing material, and NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

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

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

Components - Hardie™ Flex Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIE™ FLEX NAILS

Hardie™ Flex Nail, 40 x 2.8mm stainless steel or galvanized nail, Refer to SELECTIONS.

2.5 FASTFIX FASTENER

38 x 12mm, Nylon / White Fastfix Fasteners.

2.6 ADHESIVE

Refer to SELECTIONS.

2.7 INSEAL TAPE

Inseal® 3259, 1.5mm thick x 48mm wide black compressible medium density closed cell foam tape.

2.8 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

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Components - General

2.9 FLEXIBLE JOINT SEALANT
Refer to SELECTIONS.

Accessories

2.10 MASKING TAPE
3M Scotch Blue painters tape 2090-18E or Sellotape 5855 Long Life.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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

3.3 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work.
Moisture content timber framing: 18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 FIRE RESISTANCE RATING
Install fire rated soffit as part of a James Hardie® FRR exterior system. Refer to project drawings for FRR system construction details and Fire and Acoustic Design Manual by James Hardie® for further information.

3.6 CURVED APPLICATIONS
Install in accordance with James Hardie® installation manual requirements, mechanically fix at 200 mm centres maximum.

Application - general

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

3.8 OFFSET PATTERN SHEET LAYOUT
All sheet edges must be fully supported by framing or rebates in fascia and barge board. Sheets must be laid in an offset pattern so that adjacent end joints do not coincide.

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

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

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

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3.12 INSTALL HARDIE™ FLEX EAVES LINING

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

3.13 SEAL EDGES

Seal Villaboard™ Soffit Lining sheet edges with Multiplast Resin in a diluted form prior to flush stopping.

3.14 BUTT JOINT

Paint sheet edges prior to installation.

3.15 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.16 FASTENER - SIZE AND LAYOUT

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

3.17 INSTALL FASTFIX FASTENERS

Drill a 6mm diameter hole through the sheet and framing, insert Fastfix Fastener.

3.18 ADHESIVE

Application and use of adhesive to manufacturer's instructions and to suit the fastener layout requirements.

3.19 SEALANTS

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

3.20 FINISHING OVER DRIVEN FASTENERS

Fill over driven fasteners with Hardie™ Base Coat to the required level of finish.

3.21 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.22 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 HARDIE™ FLEX EAVES LINING

Location:	Refer to Architectural Plans
Brand/type:	James Hardie® Hardie™ Flex Eaves Lining
Thickness:	6mm
Width:	Contractor to confirm
Fixing Method:	Hardie™ Flex nails (usual fixing method)
Fixing type:	Stainless steel Hardie™ Flex Nail, 40 x 2.8mm or Galvanized Hardie™ Flex Nail, 40 x 2.8mm
Joint detail:	Hardie™ Jointer 6mm for 6mm thick sheet Express joint with Inseal 3259 tape (10mm max. gap, detail requires 70mm width framing) Butt joint with 30mm wide polypropylene or flashing tape (1mm gap) (Contractor to confirm)

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Painting

4.2 PAINTING

Refer to painting section/s for details.

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4241 PROFILED METAL CLADDING

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC C/VM2	Framework for fire safety design
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Contractor to supply

Manufacturer/supplier contact details

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

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

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

Requirements

1.6 WARRANTY - INSTALLER/APPLICATOR

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

5 years:	From the date of completion of the roof
Form:	Metal wall cladding installer's standard form

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

1.7 QUALIFICATIONS

Carry out the cladding work with experienced, competent installers familiar with the products being used and preferably with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding. And for Restricted Building Work shall also be, a LBP or supervised by a LBP.

Performance

1.8 PERFORMANCE

Install cladding materials and associated flashings and accessories to form a weathertight and durable system for the completed cladding system, including all penetrations through the walls and junctions with roofs and parapets.

1.9 SPREAD OF FIRE

To NZBC C/AS1, 5.3 External cladding systems, NZBC C/AS2, 5.5 External cladding systems, or NZBC C/VM2.

Performance - Wind (design by contractor)

1.10 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to general section 1220 PROJECT for details.

2 PRODUCTS

Materials

2.1 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.2 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

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

2.3 GALVANIZED STEEL, UNPAINTED

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

2.4 PRE-FINISHED ALUMINIUM/ZINC ALLOY COATED STEEL

Formability G550 steel sheet coated to AS 1397.

Coating class: AZ 150

2.5 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

2.6 FASTENERS GENERALLY

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

2.7 FIXING CLIPS

Galvanized steel (powder coated for aluminium) to suit the material and profile of the rigid sheet and location as required by the cladding manufacturer. Fix to steel with 16mm x 10 gauge galvanized wafer head self-drilling screws and to timber with 50mm long x 4.5mm galvanized spiral rolled flat head nails.

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2.8 FIXING SCREWS

To AS 3566. To comply with AS 3566. Screws appropriate to the cladding material and the supporting structure, as required by the cladding manufacturer and with a durability no less than the material fixed. Screws into timber to penetrate by minimum 30mm.

2.9 RIVETS

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

Components

2.10 FLASHINGS GENERALLY

Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

2.11 FLASHINGS

To NZBC E2/AS1, 4.0 Flashings. Formable grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, and 0.9mm for aluminium (or 0.7mm for small aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.12 WALL AND PARAPET FLASHINGS

To NZBC E2/AS1, 4.0 Flashings. Supplied by the cladding manufacturer to match or to suit the cladding.

Accessories

2.13 SEALANT

Neutral curing MS silicone or MS polymer sealant as required by the cladding manufacturerand used as directed.

2.14 CLOSURE STRIPS

Non-bituminous compressible, profiled foam strips to fit the sheet profile.

2.15 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

3 EXECUTION

Conditions

3.1 INSPECTION

Inspect the wall framing and supporting structure to ensure that it is complete and fully braced ready for cladding.

3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

Take delivery of and accept packs of cladding undamaged on delivery. Reject all damaged material. Store on a level firm base with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air movement between sheets.

3.4 HANDLING

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

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3.5 SEPARATION

Isolate dissimilar materials in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use unpainted lead sheet or copper in contact with or allow water run-off onto galvanized and aluminium/zinc-coated metals.

Application

3.6 SET-OUT

Set cladding to vertical plumb lines and maintain verticality. Set all exposed fixings with horizontal string lines. Carefully set out sheets with side laps away from the main line of sight, and with the widths of end sheets the same. Check during fixing to eliminate creep or spread and to keep fastenings in line.

3.7 AVOID END LAPS

End laps are not permitted, except where specifically detailed.

3.8 MOVEMENT JOINTS

Fixing and jointing to conform with the cladding manufacturer's requirements for thermal movement.

Over timber framing, transverse flashings (those running along continuous framing members) to have expansion joints at maximum 12m centres.

3.9 FIXING GENERALLY

Install and fix in accordance with the NZMRM CoP, and to the cladding manufacturer's required fixing patterns and details for each area of the building cladding. Use only screws as required by the cladding manufacturer. Paint colour matched fixings and accessories before installation.

3.10 INSTALL DRAINED CAVITY

20mm nominal thickness drained cavity to NZBC E2/AS1, 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs and provide a separation strip of metal cladding underlay over batten. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Install cavity closer/vermin-proofing at base of wall, open horizontal (or raking) junctions and over openings (windows, meters etc).

3.11 PENETRATIONS

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

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

3.12 MARKING AND CUTTING

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

3.13 FIX SHEETS

Fix sheets in place using the fastening system required by the manufacturer of the specified profiled metal cladding, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

3.14 INSTALL FLASHINGS

Flash to penetrations, cap corners and edges, using sealant and rivets to detail, to the cladding manufacturer's requirements and to NZBC E2/AS1.

3.15 COMPLETE

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

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3.16 SEPARATION

Separate metal sheeting from CCA treated timber with wall underlay or other suitable isolation material.

Completion

3.17 REPLACE

Replace all damaged or marked elements.

3.18 LEAVE

Leave this work complete with all necessary flashings and capping all properly installed as the work proceeds so the finished cladding is completely weathertight.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 PROPRIETARY CAVITY BATTENS

Type:	20mm Castellated cavity battens

4.2 CAVITY CLOSER

Brand/type:	Contractor to confirm
Material:	Contractor to confirm

4.3 PROFILED METAL ROOFING PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Brand/profile:	Freeman Alpine Tray SS675
BMT:	0.55mm BMT
Coating:	Contractor to confirm
Colour:	Contractor to confirm

4.4 FLASHINGS

Location:	Refer to Architectural Plans
Material/thickness:	0.55mm BMT
Finish:	Contractor to confirm

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4311 PROFILED METAL ROOFING

1 GENERAL

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

1.1 RELATED WORK

Refer to 4312 PROFILED PLASTIC ROOFING for plastic sheeting

Refer to 7411 RAINWATER SPOUTING SYSTEMS for rainwater disposal

1.2 ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

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

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 1665	Welding of aluminium structures
AS/NZS 1734	Aluminium and aluminium alloys - flat sheet, coiled sheet and plate
AS/NZS 1554.6	Welding stainless steels for structural purposes
ISO/TS 15510	Stainless steels - Chemical composition
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.5 WARRANTY - INSTALLER/APPLICATOR

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

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

Include a copy of the roofing manufacturers' maintenance requirements with the warranty.

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

1.6 WARRANTY - MANUFACTURER/SUPPLIER

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

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

Requirements

1.7 QUALIFICATIONS

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

Performance

1.8 CO-ORDINATE

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

1.9 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including penetrations through the roof and junctions with walls and parapets.

1.10 FIXINGS, WIND

Design and use the fixings appropriate for the design loads of this site; refer to general section 1220 PROJECT for details of wind zone. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

Performance - Wind (design by contractor)

1.11 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to general section 1220 PROJECT for details.

2 PRODUCTS

Materials

2.1 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.2 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.3 INSULATION

Refer to appropriate insulation section.

2.4 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Formability G550 steel sheet coated to AS 1397.

2.5 STAINLESS STEEL

Stainless steel sheet manufactured to ASTM A240 and ASTM A480. Welding to AS/NZS 1554.6.

2.6 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

2.7 ALUMINIUM

Aluminium alloy series 5000 temper H16 or H18 to suit application. Aluminium alloy series 5000 temper H34 for welded flashings.

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Components

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0 Flashings.

Formable grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, and 0.9mm for folded aluminium (or 0.7mm for small folded aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.9 FLASHINGS TO VERGE, RIDGE AND HIP

Supplied by the roofing manufacturer to match or to suit the roofing in the same material as the roof.

2.10 BOOT FLASHINGS

Generally to NZBC E2/AS1, 8.4.12 Roof penetrations

EPDM proprietary pipe flashing laid on 45º bias to roofing, with over-flashing (soaker flashing) if required.
A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

2.11 ALUMINIUM FLASHINGS - WELDED

Aluminium alloy series 5000 temper H34 minimum thickness 1.6mm BMT to AS/NZS 1734.
Aluminium welding to AS/NZS 1665.

2.12 STAINLESS STEEL FLASHINGS - WELDED

Welded stainless steel flashings shall be minimum thickness BMT 1.2mm and grade 304 or 316 stainless steel in accordance with Table 1 of ISO/TS 15510. Welding to AS/NZS 1554.6.

Refer to SELECTIONS for details.

Fixings

2.13 FASTENERS GENERALLY

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

2.14 FIXING CLIPS

Galvanized steel (powder coated for aluminium) to suit the material and profile of the rigid sheet and location as required by the roofing manufacturer. Fix to steel with 16mm x 10 gauge galvanized wafer head self-drilling screws and to timber with 30mm x 10 gauge galvanized wafer head screws to NZBC E2/AS1, 8.4.7 Fixings: trough profile.

2.15 FIXING SCREWS

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

2.16 RIVETS

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

Accessories

2.17 SEALANT

Neutral Curing silicone or MS polymer sealant as required by the roofing manufacturerand used as directed.

2.18 CLOSURE STRIPS

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

2.19 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

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3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

Take delivery of and accept packs of roofing undamaged on delivery. Reject all damaged material. Store on a level firm base with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air movement between sheets.

3.4 HANDLING

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

3.5 SEPARATION

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

Application

3.6 WELDING ALUMINIUM FLASHINGS

Welding to be carried out by a welder qualified under AS/NZS 1665. Preparation and welding to comply with AS/NZS 1665. Finish welds smooth and without abrupt surface changes ready for coatings. Refer to SELECTIONS for BMT and coatings.

3.7 WELDING STAINLESS STEEL FLASHINGS

Weld stainless steel flashings to AS/NZS 1554.6. Preparation and welding to comply with AS/NZS 1554.6. Finish welds smooth and without abrupt surface changes ready for coatings. Refer to SELECTIONS for BMT and coatings.

3.8 FIX INSULATION

Refer to Thermal Insulation sections.

3.9 SET-OUT

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

3.10 END LAPS

End laps are not permitted, except where specifically detailed.

3.11 MOVEMENT JOINTS

Fixing and jointing to conform with the roofing manufacturer's requirements for thermal movement.

Over timber framing, transverse flashings (those running long continuous framing members) to have expansion joints at maximum 12 centres.

3.12 FIXING GENERALLY

Install and fix in accordance with the NZMRM CoP requirements, and to roofing manufacturer's recommendations. Paint colour matched fixings and accessories before installation.

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3.13 MARKING AND CUTTING

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

3.14 FIX SHEETS

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

3.15 STOP ENDS AND DOWNTURNS

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

3.16 FLASHINGS

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

3.17 USE OF SEALANTS

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

3.18 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing to manufacturer's requirements, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

3.19 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing to manufacturer's requirements.

Completion

3.20 REPLACE

Replace damaged or marked elements.

3.21 LEAVE

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

3.22 REMOVE

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

4 SELECTIONS

Roofing

4.1 PROFILED METAL ROOFING PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Brand/profile:	Freeman Alpine Tray SS675
BMT:	0.55mm
Coating grade:	Contractor to confirm
Colour:	Contractor to confirm

Accessories

4.2 FLASHING

Material/thickness:	Refer to Architectural Plans

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4521 ALUMINIUM WINDOWS AND DOORS

1 GENERAL

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

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

1.1 RELATED WORK

Refer to glazing sections for glass types

1.2 ABBREVIATIONS AND TERMS

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

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F4/AS1	Safety from falling
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.

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BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames
BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

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

US Federal Specification:

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

1.4 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.5 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years: For fabrication

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

1.6 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 SHOP DRAWINGS

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

Provide shop drawings to show the general arrangement including, but not be limited to:
Fully dimensioned elevations of all elements
Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including: -

- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Interaction between claddings and linings
- Flashing details

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- Sealants and air seals
- Non standard fixing details including bracketing

And where required the following:

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

If requested provide the following additional information:
Information of Professional Indemnity Insurance held by the person providing the shop drawings

Submit shop drawings for review to ~.

- ~ working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Complete shop drawing review before commencing fabrication and/or installation.

1.8 QUALIFICATIONS

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

1.9 COMPLIANCE

Windows and doors to be manufactured and installed to NZBC E2/AS1.

1.10 SEISMIC SUB-FRAMES

Where required units to have seismic sub-frames. Refer to NZS 1170.5. Refer to SELECTIONS for requirements

1.11 CERTIFICATION

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

Performance

1.12 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:

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

Refer to SELECTIONS.

1.13 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

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

1.14 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.15 THERMAL PERFORMANCE - WINDOWS & DOORS

Thermal performance of windows & doors to NZBC H1/AS1 or NZBC H1/AS2 & NZBC H1/VM1 or NZBC H1/VM2. The construction R-value of windows & doors determined in accordance with NZBC H1/VM1 or NZBC H1/VM2, Appendix D, D1 Vertical windows and doors:

- Thermal transmittance of window & doors in accordance with ISO 10077-1.
- Thermal transmittance of framing in accordance with ISO 10077-2.

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- Thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

Performance - Wind (design by contractor)

1.16 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.4.

Refer to SELECTIONS for wind zone.

Finishes

1.17 CERTIFY COATINGS - POWDER COATING

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZS 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.

The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2 PRODUCTS

Materials

2.1 WINDOWS

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

2.3 ALUMINIUM EXTRUSIONS

Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.

2.4 ALUMINIUM SHEET AND STRIP

Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.

Alloy designation: 5251 - H16 or 5005 - H16

2.5 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.6 GLASS

Refer to the glazing section for glass types and installation.

2.7 REVEALS - TIMBER PAINTED

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

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 Windows and doors. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components - for cavity systems

2.9 STANDARD CAVITY CLOSER

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

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2.10 SUPPORT BAR

WGANZ extruded aluminium support bar with built in drainage and ventilation to NZBC E2/AS1, to provide continuous support to the window unit. Size to suit cladding type.

Components

2.11 GLAZING GASKETS

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

2.12 HARDWARE AND FURNITURE

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

2.13 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, **Opening windows**.

Sealants

2.14 STRUCTURAL SEALANT

Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a ± 40% movement factor complying with US Federal Specification TT-S-001543A.

2.15 WEATHERING / INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT-S-001543A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

2.16 FOAM TAPE

Foam tape to NZBC E2/AS1, paragraph 9.1.9.9.

Finishes

2.17 ANODISED ALUMINIUM

To WGANZ SFA 3503-03. Refer to SELECTIONS for thickness and colour.

2.18 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Polyester powder organic coating in accordance with WGANZ PQAS, AS 3715, and AAMA 2603

3 EXECUTION

Conditions - generally

3.1 DO NOT DELIVER

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

3.2 UNLOAD WINDOW JOINERY

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

3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE

Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

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3.6 PROTECTIVE COVERINGS

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

3.7 ADDITIONAL PROTECTION

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

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS

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

3.9 INSTALLATION FIXING

To NZBC E2/AS1, paragraph 9.1.9.10. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings.

Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

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

3.11 TIMBER / PVC REVEALS

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

3.12 HARDWARE GENERALLY

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

3.13 SAFETY STAYS

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

Installation - windows and doors

3.14 CORROSION PROTECTION

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

3.15 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

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

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1, 9.1.4 Wall underlays to wall openings.
- Full height 20mm jamb battens to NZBC E2/AS1, Figure 9.1.9.4: General window and door opening for direct fixed (direct fix only)
- claddings neatly finished off to all sides of openings

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- installation of flashings (those which are required to be installed prior to frames).

3.16 INSTALLATION

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

3.17 INSTALLATION CAVITY CONSTRUCTION

Install to WGANZ Window Installation Guide details and drawings including WGANZ sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to NZBC E2/AS1, Figure 8.5.6.1D: Junctions with walls for membrane.

3.18 INSTALL FLASHINGS

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

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

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

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE

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

3.22 PREPARE JOINTS

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

3.23 BACK UP

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

3.24 SEALANT FINISH

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

Completion - cleaning

3.25 REMOVE TRADE DEBRIS

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

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3.26 TRADE CLEAN

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

Completion

3.27 PROTECTIVE COVERINGS

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

3.28 SAFETY

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

3.29 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM

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

3.30 REMOVE

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

3.31 REPLACE

Replace damaged, cracked or marked elements.

4 SELECTIONS

Performance

4.1 THERMAL PERFORMANCE - VERTICAL WINDOWS & DOORS

Window /Door Number:	Construction R-value:
Zone 6	R0.50

Performance - Wind (design by contractor)

4.2 WIND - NON SPECIFIC DESIGN

Building wind zone H (High wind speed of 44 m/s) (refer to NZS 3604, table 5.4)

Window and door system

4.3 ALUMINIUM WINDOWS

Manufacturer: Contractor to confirm
Type / location: Refer to Architectural Plans

4.4 ALUMINIUM DOORS

Manufacturer: Contractor to confirm
Type / location: Refer to Architectural Plans

4.5 TIMBER REVEALS

Timber species: Radiata Pine
Grade / Treatment: H3.1
Thickness: 19mm
Reveals: Flush finish for architraves.

4.6 FLASHINGS

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

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4.7 STRUCTURAL SEALANT

Brand/type:	Contractor to confirm
Movement:	Contractor to confirm
Colour:	Contractor to confirm

4.8 WEATHERING SEALANT

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

Finishes - Powder Coating

4.9 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Type:	Polyester organic powder coating - Extra-Durable powder coating (AAMA 2603)
System integrity:	Minimum 10-years film integrity; 10-years colour integrity
Thickness:	Average of 90 microns with a minimum of 50 microns
Colour:	Contractor to confirm
Finish:	Contractor to confirm

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4610 GLAZING RESIDENTIAL

1 GENERAL

This section relates to the supply and fixing of glass products for external and internal joinery in residential type buildings and includes:

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

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 636	Protecting Glass From Damage

1.4 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available at

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

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

Performance

1.6 THERMAL PERFORMANCE - EXTERNAL GLAZING

Provide external glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1 or H1/AS2 and NZBC H1/VM1 or H1/VM2.

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

2 PRODUCTS

Materials

2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness to NZS 4223.1 and NZS 4223. Supp 1.

2.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

2.3 LAMINATED GLASS

Grade A Safety Glass to AS/NZS 2208 with PVB or CIP resin interlayer.

2.4 TOUGHENED GLASS

Grade A Safety Glass to AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E required for critical areas.
Refer to SELECTIONS.

2.5 INSULATING GLASS UNITS (IGU'S)

To AS/NZS 4666, NZS 4223.2 and the IGU Manufacturers Association (IGUMA) requirements.

Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Refer to SELECTIONS for specified surfaces of the IGU.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:
- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

Materials, mirrors

2.6 MIRROR GLASS

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

2.7 SAFETY MIRROR GLASS

4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to AS/NZS 2208.

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Materials, screens

2.8 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, wall mounted glass (mirrors and splashbacks)

2.9 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

2.10 GLASS MOUNTING CHANNELS

Refer to SELECTIONS/drawings for type and finish.

2.11 MIRROR DE-MISTER

Refer to appropriate eletrical section(s) for type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.3, NZS 4223.4. All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by NZS 4223.1, NZS 4223.3, NZS 4223.4 and NZS 4223. Supp 1. For windows tested to NZS 4211, ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading or human impact considerations govern.

3.5 REBATE DIMENSIONS

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

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

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

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

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Assembly

3.10 WORKING OF GLASS
All working of glass as required in NZS 4223.1.

3.11 EDGE WORK AND BEVELLING
Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

3.12 SURFACE TREATMENT
Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING
Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS
To NZS 4223.3.

Application aluminium

3.15 INSTALL GLASS TO ALUMINIUM FRAMES
Install glass to NZS4223.1.

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

Application - wall mounted glass (mirrors and splashbacks)

3.16 WALL MOUNTED GLASS, SCREW FIXED
For mirrors and splashbacks, fix with proprietary zinc-plated steel countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.

3.17 WALL MOUNTED GLASS, CHANNEL MOUNTED
For mirrors and splashbacks,fix with proprietary mounting channels, to the channel manufacturer's requirements.

3.18 WALL MOUNTED GLASS, ADHESIVE FIXED
For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m2 per 1 m2 of glass to NZS 4223.3.

Application miscellaneous

3.19 INSTALL GLASS BALUSTRADES
Confirm/design and carry out installation to

NZS 4223.3, 22 Barriers (Balustrades, fences, and screens).
NZBC F4/AS1: Safety from falling, 1.0 Barriers in buildings.

3.20 INSTALL GLASS SHOWER & BATH SCREENS
Install shower and bath screens and doors to manufacturer's requirements.

Finishing

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

Completion

3.22 TRADE CLEAN
Clean off or remove safety indicators at completion of the building.

3.23 REPLACE
Replace damaged, cracked or marked glass.

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3.24 LEAVE

Leave work to the standard required by following procedures.

3.25 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Performance - wind

4.1 WIND ZONE - NON-SPECIFIC DESIGN

Building wind zone: H (High wind speed of 44 m/s) (as determined from NZS 3604, NZS 4223.4)

Glass by type

4.2 CLEAR FLOAT GLASS

Location:	Refer to Architectural Plans
Brand/type:	Contractor to confirm
Thickness:	Contractor to confirm

4.3 OBSCURE GLASS

Location:	Refer to Architectural Plans
Brand/pattern:	Contractor to confirm
Thickness:	Contractor to confirm

4.4 TOUGHENED GLASS

Location:	Refer to Architectural Plans
Brand/type:	Contractor to confirm
Thickness:	12mm - Contractor to confirm

Bath and shower screens and doors

4.5 FRAMELESS GLASS SHOWER SCREENS AND DOORS

Location:	Refer to Architectural Plans
Brand/type:	Contractor to confirm - Safety Glass
Thickness:	12mm - Contractor to confirm

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4710P PINK® BATTS® THERMAL & ACOUSTIC INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions® Pink® Batts® thermal and acoustic insulation materials for walls, floors, ceilings and roofs.

1.1 RELATED WORK

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting, wall underlays and roofing underlays.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BIB	Building Insulation Blanket
IIC	Impact Insulation Class
STC	Sound Transmission Class

Documents

1.3 DOCUMENTS

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

NZBC G6/VM1	Airborne and impact sound
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/ New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Comfortech H1 Overview
Comfortech Pink® Batts® Insulation - Safety Data Sheet
Comfortech Pink® Batts® Thermal Solutions - Product Guide (May 2025)
Comfortech Pink® Batts® Ceiling Product & Insulation Guide (June 2025)
Comfortech Pink® Batts® Skillion Roof Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® Wall Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® SnugFloor® Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® BIB Product & Installation Guide (July 2025)
Comfortech Pink® Superbatts® Thermal Solutions - Installation Guide (Jan 2025)
Comfortech Pink® Batts® Silencer® Acoustic Installation Instructions
Comfortech Pink® Batts® Silencer® Wall & Midfloor Data Sheet
Comfortech Pink® Batts® Insulation Product Warranty
BRANZ Appraisal 238 (2023) - Pink® Batts® Insulation - Amended 23 February 2026
BRANZ Appraisal 632 (2023) - Pink® Batts® SnugFloor® Insulation - Amended 12 August 2024
BRANZ Appraisal 767 (2023) - Pink® Batts® Skillion Roof Insulation - Amended 21 January 2026

Manufacturer/supplier contact details

Company:	Tasman Insulation NZ Ltd
Trading as:	Comfortech Building Performance Solutions®
Web:	www.pinkbatts.co.nz
Telephone:	0800 746 522

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Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For Pink® Batts® insulation products

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year	For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 NO SUBSTITUTIONS

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

Compliance information

1.9 COMPLIANCE - BRANZ APPRAISAL 238

Pink® Batts® Insulation has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 238.

1.10 COMPLIANCE - BRANZ APPRAISAL 767

Pink® Batts® Skillion Roof Insulation has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 767.

Performance

1.11 FIRE PROPERTIES - NON COMBUSTIBLE

Pink® Batts® insulation products are classified as non-combustible when tested to NZS/AS 1530.1 and achieve a Group Number of 1-S.

1.12 SOUND CONTROL SITE TEST

Site test each sound rated element to NZBC G6/VM1 for compliance with specified sound transmission loss, using a nominated acoustic consultant. Rectify any element that does not meet the specified STC/IIC figure.

2 PRODUCTS

Materials - thermal insulation

2.1 PINK® BATTS® THERMAL INSULATION BATTS

Bio-soluble fibrous glass wool slabs manufactured from minimum 80% recycled window glass and bonded with thermosetting resin to AS/NZS 4859.1. Coloured Pink for identification. Available in a range of R-values, sizes and thicknesses. Refer to SELECTIONS.

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2.2 PINK® BATTS® THERMAL INSULATION BIB

Bio-soluble fibrous glass wool roll manufactured from minimum 80% recycled window glass and bonded with thermosetting resin. Coloured Pink for identification. Available in a range of R-values, sizes and thicknesses. Refer to SELECTIONS.

Materials - acoustic insulation

2.3 PINK® BATTS® SILENCER® ACOUSTIC INSULATION BATTS

Bio-soluble fibrous glass wool slab manufactured from minimum 80% recycled window glass and bonded with thermosetting resin. Coloured Grey for identification. Available in a range of R-values, sizes and thicknesses. Refer to SELECTIONS.

Components

2.4 WIRE NETTING

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

2.5 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation - general

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSULATION CLEARANCES

Provide insulation clearances to NZS 4246 and for recessed luminaires AS/NZS 3000, 4.5.2.3. Where allowed by these standards provide insulation clearances to product manufacturer's stated clearances. Secure insulation in place so clearances are maintained and use guards/barriers , if required, where insulation is not secured.

3.6 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/roof joists (under purlins). Pull tight and fix.

3.7 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips.

3.8 LAY PLASTIC STRAPPING TAPE

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

3.9 PREPARATION INSULATION

Before installation, gently agitate the insulation by shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Maintain the insulation in a dry state.

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3.10 CUTTING INSULATION TO SIZE

Tear insulation by hand or cut with an insulation saw/knife, sharp scissors, or with sharp wide-blade knife. Cut slightly oversized for snug friction fit.

Installation - thermal insulation

3.11 INSTALL INSULATION - GENERALLY

Install insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to Pink® Batts® installation requirements and to NZS 4246 for all housing and buildings up to 300m². Allow insulation to re-loft/relax prior to installation. Do not cover vents. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath. Use insulation offcuts to fill small gaps between framing.

3.12 INSTALL PINK® BATTS® TIMBER WALL INSULATION

Friction fit insulation slabs between framing.

3.13 INSTALL PINK® BATTS® MASONRY WALL INSULATION

Friction fit insulation slabs between vertical strapping members. Staple the top of the insulation to the inside face of the strapping.

3.14 INSTALL PINK® BATTS® CEILING INSULATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.15 INSTALL PINK® SUPERBATTS® CEILING INSULATION - SINGLE LAYER INSTALLATION

Notch out the underside of the first slab to the same size as the truss cord. Friction fit slabs between truss framing with notch fit over truss bottom chord. Butt up adjacent slab under slight compression. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.16 INSTALL PINK® SUPERBATTS® CEILING INSULATION - DOUBLE LAYER INSTALLATION

Lay upper layer slabs over truss bottom chord perpendicular to chord. From underneath, friction fit the lower layer slabs between the truss bottom chords. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.17 PINK® BATTS® SKILLION ROOF INSULATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.18 INSTALL PINK® SUPERBATTS® SKILLION ROOF INSULATION - SINGLE LAYER INSTALLATION

Friction fit insulation slabs between framing. Install to the midpoint of the top plate. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

3.19 INSTALL PINK® SUPERBATTS® SKILLION ROOF INSULATION - DOUBLE LAYER INSTALLATION

Friction fit upper layer of insulation slabs between framing. Install to the midpoint of the top plate. From underneath, friction fit the lower layer slabs between the ceiling battens. Maintain a 25mm gap clearance between the insulation slabs and roof underlay.

Installation - acoustic insulation

3.20 INSTALL PINK® BATTS® SILENCER® WALL INSULATION

Friction fit insulation slabs between framing when lining on one side is installed. Maintain full thickness of the slabs over the whole of the installation.

Completion

3.21 COMPLETION MATTERS

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

4 SELECTIONS



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

Materials - thermal insulation

4.1 PINK® BATTS® WALL INSULATION

Location:	Refer to Architectural Plans
Brand/ Type:	Pink® Batts® Ultra® R2.8 Wall Insulation and Pink® Batts® Ultra® R3.2 140mm Wall Insulation
R-value:	R2.8 and R3.2
Nominal stabilised thickness:	90mm and 140mm

4.2 PINK® BATTS® CEILING INSULATION

Location:	Refer to Architectural Plans
Brand/ Type:	Pink® Superbatts® R7.0 Ceiling Insulation
R-value:	R7.0
Nominal stabilised thickness:	275mm

4.3 PINK® BATTS® SKILLION ROOF INSULATION

Location:	Refer to Architectural Plans
Brand/ Type:	Pink® Superbatts® Skillion Roof R6.0 Insulation
R-value:	R6.0
Nominal stabilised thickness:	230mm max



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4821 FLASHINGS

1 GENERAL

This section relates to the fabrication and installation of flashing systems not forming part of a proprietary system.

1.1 RELATED WORK

Refer to Architectural Plans

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Requirements

1.3 QUALIFICATIONS

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

1.4 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.5 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1, Table C.1.1.1 and NZBC E2/AS1, Table C.1.1.1A: Material selection.

1.6 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1, Table C.1.1.1A: Material selection, to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

1.7 PROTOTYPES - REVIEW

Refer to the general section 1270 CONSTRUCTION for details of how prototypes will be reviewed and how instructions to proceed will be given. For flashings where there are no specific details or drawings, provide full size prototypes of the flashings to integrate components into the weathertight system. Co-ordinate with the trades affected by the installation. Provide the prototype flashings to the contract administrator for review.

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2 PRODUCTS

2.1 FLASHING MATERIALS

Acceptable materials for flashings are described in NZBC E2/AS1, 4.0 Flashings. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the building and cladding materials and their fixings.

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0 Flashings, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0 Flashings, or as shown on the drawings.

2.3 FIXINGS

Rivets, screws, nails and cleats to be compatible with the materials being fastened. Fasteners complying with the corrosion requirements of AS 3566 are suitable for use with ZINCALUME® steel products. Use only low carbon non-conductive sealing washers.

2.4 JOINTS - SEALANTS

Neutral Curing silicone or MS polymer sealant as required, with low resistance to compression and be-able to withstand large temperature variations. MS polymer sealant to be used where the sealant is exposed and the surrounding surfaces are to be subsequently painted or coated.

2.5 JOINTS - SOLDER

Eutectic solder of 60% tin/40% lead using a suitable proprietary flux.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep flashings dry in transit. Take delivery of flashings in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, well ventilated, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until fixed.

3.3 HANDLING

Avoid distortion and contact with potentially damaging surfaces/substances. Do not drag flashings across each other, or across other surfaces. Protect edges, corners and surfaces from damage.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the installer for the specified flashings, level and in true alignment.

3.5 PROTECT

Protect surfaces, window and door joinery, and finishes already in place, from the possibility of damage during the installation process.

3.6 CONFIRM LAYOUT

Before commencing work confirm the proposed installation of the flashings and expansion joints and other visual considerations of the finished work.

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

Install flashings in accordance with NZMRM CoP and in compliance with NZBC E2/AS1, 4.0 Flashings. For very high wind zones and where the pitch of the roof is below 15° the flashing joint laps shall be sealed with sealant at each end of the lap to prevent the ingress of water.

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Refer to NZBC E2/AS1, Table 4.5.1.1: General dimensions of metal flashings and other flashings as listed, for general dimensions of flashings.

3.9 FIXINGS

Fix flashings with fasteners appropriate to the situation. For fixing flashings with proprietary brackets or clips ensure they are aligned to allow for movement and are compatible with the flashing material.

Fix screws with the shank perpendicular to the surface of the flashing with the washer fitted firmly against the flashing. Screws to be compatible with the flashing material.

Rivets 'blind' or 'pop' are to be sealed when used. Aluminium rivets are compatible with zinc or AZ coated steel. Monel and stainless steel rivets can be used to fix galvanized steel flashings. Minimum diameter of rivet to be used is 4.0mm. Drill hole 1mm larger than the rivet size. Seal head of rivet with neutral cured silicone.

3.10 JOINTING - SEALANTS

Clean surfaces to be lapped using a solvent ensuring all traces of the solvent are removed with a clean rag. Apply sealant by gun in a continuous bead of approximately 5mm diameter. Width of sealant when compressed should not exceed 25mm. Sealant joints shall be mechanically fixed for strength. Refer to NZMRM CoP for details.

3.11 JOINTING - SOLDER

Solder joints in galvanized steel and non-ferrous metals when specified with lead/tin solder. Clean joint ensuring it is dry and free of grease immediately prior to applying a proprietary flux. Lap the flashing 25mm in the direction of the water flow and fasten the lap with rivets or screws at 50mm centres. Completely sweat the joint to avoid leaving any flux residue. Wash down the joint to remove any trace of flux.

3.12 FINAL INSPECTION

A final inspection by the installer to take place after completion of the flashing work. Any defects or subsequent damage to be made good.

Completion

3.13 PROTECT

Protect new work from damage.

3.14 REPLACE

Replace all damaged or marked elements.

3.15 LEAVE

Leave work to the standard required for following procedures.

3.16 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 FLASHINGS

Type	Refer to Architectural Plans, Details
General flashings:	0.55mm Colorsteel
Material and finish/colour	Roof flashings to match roofing. Window flashings to match window & door joinery.

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5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply and installation of Winstone Wallboards Ltd GIB® plasterboard linings to walls and ceilings.

1.1 RELATED WORK

Refer to ~ for ~.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
FRR	Fire resistance rating
IIC	Impact insulation class
Rw	Weighted sound reduction index
STC	Sound transmission class

Documents

1.3 DOCUMENTS

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

BPS	Building Product Specifications
AS/NZS 2588	Gypsum plasterboard
AS 1530.4	Methods for fire tests on building materials, components and structures - Fire-resistance tests for elements of construction
ISO 5660.1	Reaction-to-fire tests – heat release, smoke production and mass lose rate – Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	A wall bracing test and evaluation procedure (2010)

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

GIB® Noise Control Systems Specification and Installation Manual (September 2017)
GIB® Fire Rated Systems Specification and Installation Manual (September 2024)
GIB® Wet Area Systems Specification and Installation Manual (February 2021)
GIB Weatherline® Rigid Air Barrier Systems Design and Construction Manual (March 2021)
GIB Curveline® Specification and Installation Manual for Curved Walls and Ceilings (November 2025)
GIB Ezybrace® Systems Specification and Installation Manual (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIB® Tough Systems Design and Installation Guide (May 2025)
GIBFix® Framing System (August 2016)
GIB® Rondo® Metal Batten Systems Specification and Installation Manual (September 2024)
GIB® Site Guide
GIB® Product BPIS
GIB® Plasterboard Lining Systems Care and Maintenance
GIB® Product and System Warranty
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems
BRANZ Appraisal 394 (2025) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems
BRANZ Appraisal 1048 (2025) GIB Weatherline® Rigid Air Barrier Systems

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Manufacturer/supplier contact details
Company: Winstone Wallboards Ltd
Web: www.gib.co.nz
Telephone: 0800 100 442

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years For GIB® products and systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years For workmanship

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
GIB® Plasterboard Lining Systems Care and Maintenance

Provide this information prior to practical completion.

Compliance information

1.9 COMPLIANCE - BRANZ APPRAISAL 289

GIB® Fire Rated Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 289.

1.10 COMPLIANCE - BRANZ APPRAISAL 394

GIB® Noise Control Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 394.

1.11 COMPLIANCE - BRANZ APPRAISAL 427

GIB® Wet Area Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 427.

1.12 COMPLIANCE - BRANZ APPRAISAL 928

GIB EzyBrace® Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 928.

1.13 COMPLIANCE - BRANZ APPRAISAL 1048

GIB Weatherline® Rigid Air Barrier Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1048.

1.14 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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Performance

1.15 BRACING

GIB EzyBrace® Systems have been tested and analysed using the BRANZ Technical Paper P21 test method to BPS, 3.5.3 Wall bracing elements.

1.16 ACOUSTIC RATED SYSTEMS

GIB® Noise Control Systems have been tested for Sound Transmission Class STC and/or Impact Insulation Class. Refer to SELECTIONS for STC/IIC ratings.

2 PRODUCTS

Materials

2.1 GIB® STANDARD PLASTERBOARD

Paper-bound gypsum plaster core sheet lining, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.2 GIB AQUALINE® PLASTERBOARD

Paper-bound, modified water-resistant gypsum plaster core sheet lining, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.3 GIB TOUGHLINE® AQUA PLASTERBOARD

Paper-bound, high-density gypsum plaster core sheet lining with modified water-resistant formulation and embedded fibreglass mesh, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.4 GIB WEATHERLINE® PLASTERBOARD

Exterior-grade glass-fibre fleece-wrapped modified gypsum core sheet lining with water and mould resistant properties, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.5 GIB TOUGHLINE® PLASTERBOARD

Paper-bound, high-density gypsum plaster core sheet lining with embedded fibreglass mesh, material manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.6 GIB BRACELINE®/GIB NOISELINE® PLASTERBOARD

Paper-bound, high-density gypsum plaster core sheet lining manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.7 GIB FYRELINE® PLASTERBOARD

Paper-bound, high-density gypsum plaster core sheet lining with glass fibres and fire-resistant additives, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.8 GIB CURVELINE® PLASTERBOARD

Paper-bound gypsum plaster core sheet lining, formulated for forming tight curves, manufactured to AS/NZS 2588. Refer to SELECTIONS.

2.9 STRUCTURAL PLYWOOD

Minimum 7mm thick, square edge structural plywood, Type A phenolic bonded timber veneers to AS/NZS 2269.0. Refer to SELECTIONS.

Components

2.10 GIB® RONDO® METAL BATTEN SYSTEM

Hot-dipped galvanized steel ceiling battens, batten joiners, fixing clips, and perimeter channel. Refer to SELECTIONS.

2.11 GIBFIX® ANGLES

45mm x 45mm metal angles.

2.12 GIB® GRABBER® SCREWS

Proprietary drywall screws. Refer to SELECTIONS.

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2.13 GIB® TRIMS AND EDGES

Proprietary corner trims and edge beads available as paper-faced galvanized steel, perforated galvanized steel, and composite moulds. Refer to SELECTIONS.

2.14 GIB® CONTROL JOINTS

Proprietary control joints available as paper-laminated galvanized steel, perforated galvanized steel, and plastic. Refer to SELECTIONS.

Accessories

2.15 GIBFIX® ADHESIVE

Proprietary wallboard adhesive. Available in water-based and solvent-based formulations. Refer to SELECTIONS.

2.16 GIB® JOINTING COMPOUND

Proprietary jointing compounds. Available in a range of plaster-based and polymer-based compounds. Refer to SELECTIONS.

2.17 GIB® JOINT TAPE

Proprietary joint tape. Available in paper and fibreglass. Refer to SELECTIONS.

2.18 GIB HANDIBRAC® HOLD DOWN BRACKET

Galvanized steel bracket supplied with 5 Tek screws and 2 BOWMAC blue head screw bolts.

2.19 PINK BATTS GLASS WOOL INSULATION

Bio-soluble fibrous glass wool insulation. Refer to SELECTIONS.

2.20 GIB-COVE®

Paper-encased gypsum plaster cornice. Available in a range of profiles and sizes. Refer to SELECTIONS.

2.21 RONDO® FLEXIBLE TRACK

0.50 BMT steel track with Z275 corrosion resistant coating. Available in a range of widths to suit framing. Refer to SELECTIONS.

2.22 GIB WEATHERLINE® FLASHING TAPE

Proprietary self-adhesive flashing tape.

2.23 GIB FIRE SOUNDSEAL®

Proprietary water-based acrylic sealant with fire and acoustic properties.

2.24 GIB GAP FILLER

Proprietary flexible water-based acrylic gap filler.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Timber framing: 18% maximum moisture content



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Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install plasterboard linings in accordance with the relevant GIB® system installation instructions and the GIB® Site Guide.

3.6 INSTALL RONDO FLEXIBLE TRACK

Coordinate flexible track installation with framing construction. Fit track to the top and bottom of curved walls and fix studs through the pre-punched holes.

GIB® Rondo® Ceiling Batten System

3.7 LAYOUT CEILING BATTEN SYSTEM

Determine the ceiling height datum. Set out and mark batten centres along the framing to the required batten spacing.

3.8 INSTALL PERIMETER CHANNEL/ANGLE

Install ceiling perimeter channels/angles level to walls at determined datum height.

3.9 INSTALL FIXING CLIPS

Set a string line on the datum along the framing. Install fixing clips to the required batten spacing, using the string line to maintain level.

3.10 INSTALL CEILING BATTENS - DIRECT FIX

Cut battens to allow a 5mm gap at the perimeter. Seat batten ends in the perimeter channel/angle. Fix battens to framing and perimeter channels without distortion.

3.11 INSTALL CEILING BATTENS - CLIP FIX

Seat batten ends in the perimeter channel/angle. Clip fit battens into fixing clips and fix battens to perimeter channels without distortion.

GIB® Plasterboard

3.12 INSTALL GIBFIX® ANGLES

Install angles continuously to the timber framing at wall and ceiling junctions. Overlap adjacent angles by a minimum of 300mm at joints.

3.13 INSTALL PLASTERBOARD LININGS - WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix to framing at 300mm centres around the wall perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive.

Place fasteners 12mm from paper-bound edges, 18mm from cut edges, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.

3.14 INSTALL PLASTERBOARD LININGS - GIBFIX® FRAMED WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix to framing at 300mm centres around the wall perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive.

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At GIBFix® Angle junctions, fix the sheet to the stud side first, then to the angle-only side. Where the angle-only side must be fixed first, install additional clouts into the framing at maximum 500mm centres before lining. Place fasteners 12mm from paper-bound edges, 18mm from cut edges, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.

3.15 INSTALL PLASTERBOARD LININGS - CEILINGS

Install sheets perpendicular to ceiling framing. Form all sheet joints off frame with back-blocking, staggering sheet end joints a minimum of 600mm. Apply daubs of adhesive to the battens at 200mm centres between fastener locations. Fix around the ceiling perimeter at 600mm centres. Fix sheets to each batten along sheet edges and sheet centres. Place fasteners 12mm from tapered sheet edges, 18mm from cut edges. Touch fit adjacent sheets.

GIB® Tough Systems

3.16 INSTALL PLASTERBOARD LININGS - TOUGH SYSTEM WALLS

Horizontally fixed sheets: Install sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres with daubs of adhesive.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres with daubs of adhesive.

Place fasteners 12mm from sheet edges, 18mm from sheet ends, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.

GIB® Wet Area Systems

3.17 INSTALL CORNER REINFORCING - TILED WET AREA WALLS

Install angles continuously to the framing at internal corner junctions in tiled showers and tiled showers over bath to a minimum height of 1800mm.

3.18 INSTALL PLASTERBOARD LININGS - NON-TILED TIMBER FRAMED WET AREA WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix to framing at 300mm centres around the wall perimeter. Fix to intermediate framing at 300mm centres daubs of adhesive. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres daubs of adhesive.

Place fasteners 12mm from sheet edges, 18mm from sheet ends, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.

3.19 INSTALL PLASTERBOARD LININGS - NON-TILED STEEL FRAMED WET AREA WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix to framing at 300mm centres around the wall perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres with fasteners or daubs of adhesive.

Place fasteners 12mm from sheet edges, 18mm from sheet ends, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.



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3.20 INSTALL PLASTERBOARD LININGS - TILED WET AREA WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix to framing at 150mm centres around the wall perimeter and to intermediate framing. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud. Support horizontal sheet edge joints on nogs in showers and shower-over-bath walls.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix to framing at 150mm centres around the sheet perimeter. Fix to intermediate framing at 150mm centres.

Place fasteners 12mm from sheet edges, 18mm from sheet ends, and 50mm in each direction from corners. Touch fit adjacent sheets. Leave a 5mm-10mm gap at floor level.

3.21 INSTALL PLASTERBOARD LININGS - WET AREA CEILINGS

Install sheets perpendicular to ceiling framing. Form sheet joints off frame with back-blocking, staggering sheet end joints a minimum of 600mm. Apply daubs of adhesive to the battens at 200mm centres between fastener locations. Fix around the ceiling perimeter at 600mm centres. Fix sheets to each batten along sheet edges and sheet centres. Place fasteners 12mm from sheet edges. Touch fit adjacent sheets.

GIB EzyBrace® Systems

3.22 INSTALL HOLD DOWN BRACKETS

Fix GIB® HandiBrac® hold-down brackets at each end of bracing element with supplied fasteners.

3.23 INSTALL PLASTERBOARD LININGS - BRACED WALLS

Horizontally fixed sheets: Install sheets with vertical sheet end joints fully supported. Fix the perimeter of the bracing element to the framing to the GIB EzyBrace® fastener pattern. Fix to intermediate framing at 300mm centres with daubs of adhesive. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets: Install full-height sheets with the sheet perimeter fully supported. Fix the perimeter of the bracing element to the framing to the GIB EzyBrace® fastener pattern. Fix vertical sheet edge joints to framing at 300mm centres. Fix to intermediate framing at 300mm centres with daubs of adhesive.

Place fasteners 12mm from paper-bound edges and 18mm from cut edges. Touch fit adjacent sheets.

3.24 INSTALL STRUCTURAL PLYWOOD - BRACED WALLS

Install full-height plywood sheets vertically with sheet perimeter fully supported. Fix to framing at 150mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres.

3.25 INSTALL PLASTERBOARD LININGS - CEILING DIAPHRAGM

Install sheets perpendicular to ceiling framing. Form sheet joints off frame with back-blocking, staggering sheet end joints a minimum of 600mm. Fix the diaphragm perimeter to the framing to the GIB EzyBrace® fastener pattern. Apply daubs of adhesive to the battens at 200mm centres between fastener locations. Fix around the ceiling perimeter at 600mm centres. Fix sheets to each batten along sheet edges and sheet centres. Place fasteners 12mm from sheet edges and 18mm from sheet ends. Touch fit adjacent sheets.

GIB® Noise Control Sub-intertenancy Systems

3.26 INSTALL INSULATION

Refer to relevant Pink Batts section(s) for insulation installation requirements.

3.27 APPLY SEALANT - SUB-INTERTENANCY WALLS

Apply a continuous bead of GIB Fire Soundseal® around the wall perimeter. Where a two-layer system is required, apply sealant to the perimeter over first plasterboard layer before installing the second layer.



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3.28 INSTALL PLASTERBOARD LININGS - QUIET STUD SUB-INTERTENANCY WALLS

Install full-height sheets vertically with the sheet perimeter fully supported. Fit sheets hard to the floor. Fix to framing at 300mm centres. In two-layer systems offset joints 600mm. Place fasteners 12mm from sheet edges and 50mm from sheet ends. Touch fit adjacent sheets.

3.29 INSTALL PLASTERBOARD LININGS - SUB-INTERTENANCY WALLS

Single layer, or inner layer (two-layer system): Install full-height sheets vertically with the sheet perimeter fully supported. Fit sheets hard to the floor. Fix to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres.

Where a two-layer plasterboard system is required, offset sheet joints by 600mm. The outer layer can be fixed horizontally or vertically.

Horizontally fixed sheets (outer layer): Fix to framing at 300mm centres around the wall perimeter. Fix to intermediate framing at 300mm centres with fasteners. Fix a single fastener each side of horizontal sheet edge joints where crossing a stud.

Vertically fixed sheets (outer layer): Fix full-height sheets to framing at 300mm centres around the sheet perimeter. Fix to intermediate framing at 300mm centres.

Place fasteners 12mm from paper-bound edges, 18mm from cut edges, and 50mm in each direction from corners. Touch fit adjacent sheets.

3.30 APPLY SEALANT - SUB-INTERTENANCY CEILINGS

Apply a continuous bead of GIB Fire Soundseal® around the ceiling perimeter. Where a two-layer system is required, apply sealant to the perimeter over first plasterboard layer before installing the second layer.

3.31 INSTALL PLASTERBOARD LININGS - SUB-INTERTENANCY CEILINGS

Install sheets perpendicular to ceiling framing with sheet end joints supported on the framing. Fix to ceiling battens at 200mm centres and along sheet end butt joints at 100mm centres. Place fasteners 12mm from sheet edges. Touch fit adjacent sheets. Where a two-layer plasterboard system is required, offset sheet joints by 600mm.

GIB® Jointing and Finishing Systems

3.32 FIX GIB® SLIM ANGLE METAL TRIM

Screw fix metal trims over plasterboard at 300mm centres.

3.33 FIX GIB® PLASTIC/GIB® RONDO® P35 METAL CONTROL JOINTS

Fit the control joint trim into the gap between plasterboard sheets. Staple to the plasterboard at 150mm centres on each side of the joint.

3.34 JOINTING AND STOPPING

Apply first coat of bedding compound 150mm wide to joints, 75mm along corner faces, and 75mm each side of control joints. Embed joint tape, and paper-faced trims or control joints where required, in the compound. Cover with a thin layer of bedding compound over tape and allow to dry. Apply a second coat of bedding compound, extending a minimum of 25mm beyond the first coat. Feather the edges and allow to dry. Apply finishing compound, extending a minimum of 25mm beyond the second coat. Feather the edges and allow to dry. Lightly sand with fine sandpaper. Stop all fastener heads. Finish smooth and free of tool marks and ridges.

3.35 INSTALL COVES

Apply continuous beads of GIB-Cove® Bond jointing compound to the wall and ceiling contact faces of the selected cornice profile. Press firmly into position and wipe off excess adhesive.

Completion & Commissioning

3.36 COMPLETION MATTERS

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

4 SELECTIONS

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

GIB® Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Plans, Finishes Plan	GIB® Standard plasterboard	10mm	Refer to Architectural Plans, Finishes Plan

4.2 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Plans, Finishes Plan	GIB® Standard plasterboard	13mm	Refer to Architectural Plans, Finishes Plan

4.3 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Refer to Architectural Plans, Finishes Plan	GIB Aqualine® plasterboard	13mm	Refer to Architectural Plans, Finishes Plan

4.4 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (2011)

For bracing element location refer to drawn documentation.

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5230 INTERIOR DOORS

1 GENERAL

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

1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC	Forest Stewardship Council
PEFC	Programme for the Endorsement of Forest Certification

1.3 DOCUMENTS

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

NZS 3602	Timber and wood-based products for use in building
NZS 3610	Specification form profiles of mouldings and joinery

1.4 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

2 PRODUCTS

2.1 TIMBER

To NZS 3602.

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

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

2.3 DOORS, PAINTED

Doors as scheduled (without clashing strips).

2.4 CAVITY SLIDERS

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

2.5 DOOR HINGES

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

3 EXECUTION

3.1 SITE MEASURE

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



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3.2 EXECUTION GENERALLY

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

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified:

- Hinges

3.4 FACTORY FINISHING

Before delivery to site:

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

Internal doors

3.5 INTERNAL JOINERY FRAMES

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

3.6 DOOR FRAMES, SOLID REBATED

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

3.7 DOOR LINERS

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

3.8 DOOR LINERS, EXTENDED

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

3.9 CAVITY SLIDERS

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

Completion

3.10 CHECK

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

3.11 TEMPORARY PROTECTION

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

4 SELECTIONS

4.1 SOLID CORE DOOR

Refer to Architectural Plans, Window and Door schedule

4.2 CAVITY SLIDER DOOR

Refer to Architectural Plans, Window and Door schedule

Accessories

4.3 DOOR HINGES

Interior doors

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

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6221M MAPEI FLOOR TILING SOLUTIONS

1 GENERAL

This section relates to the supply and installation of MBP (NZ) Ltd internal and external floor tiling systems.

It includes:

- primers
- screed and levelling compounds
- acoustic underlays
- waterproofing membranes
- adhesives
- grouts
- sealants

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

CFC	Compressed fibre cement
PVC	Polyvinyl chloride
WMAI	Waterproofing Membrane Association (NZ) Incorporated
WPM	Waterproofing membrane

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
ISO 13007.1	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for adhesives
ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
NZS 4121	Design for access and mobility - Buildings and associated facilities
WMAI CoP	Code of Practice for Internal Wet Area Membrane Systems

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Mapei® Technical Manual - Tile Installer's Manual - Products for Ceramic Tiles (Sept 2016)
Mapei® Technical Manual - Cementitious adhesives for installing ceramic tiles and natural stone (Sept 2016)
Mapei® Technical Manual - Guide for the Installation of Ceramic Materials (Sept 2018)
Mapei® product Technical Data Sheets
BRANZ Appraisal 484 (2018) - Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes - Amended 6 October 2022
BRANZ Appraisal 485 (2018) - Mapelastic Smart and External Waterproofing Membranes - Amended 6 October 2022
Mapei® product BPIR

Manufacturer/supplier contact details

Company:	MBP (NZ) Ltd.

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Web: www.mbpltd.co.nz
Email: enquiries@mbpltd.co.nz
Telephone: 09 921 1994

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a tile manufacturer/supplier warranty:

2 years: For tiling products

- Provide this warranty on the manufacturer/supplier standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For Mapelastic AquaDefense, Mapelastic Smart and Mapegum WPS

10 years For other Mapei ceramic tile products (excluding Ultracare products)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Waterproofing applicators to be approved by MBP (NZ) Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.9 NO SUBSTITUTIONS

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

Compliance information

1.10 COMPLIANCE - BRANZ APPRAISAL 484

Mapegum WPS, Mapelastic AquaDefense and Mapelastic Smart internal wet area membranes have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 484.

1.11 COMPLIANCE - BRANZ APPRAISAL 485

Mapelastic Smart external wet area membrane has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 485.

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1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicator approval certificate from the manufacturer / importer / distributor
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents

Performance - fire

1.13 SURFACE FIRE PERFORMANCE - FLOORS

Tiles composed entirely of ceramic are non-combustible.

Performance - slip resistance

1.14 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

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

1.15 SLIP RESISTANCE - PREVIOUSLY TESTED SURFACE

The following walking surfaces have previously been tested for slip resistance, and comply with NZBC D1/AS1 requirements.

1.16 TEST - SLIP RESISTANCE

Test walking surfaces for slip resistance, refer to SELECTIONS for test condition.

2 PRODUCTS

Underlay

2.1 FIBRE CEMENT UNDERLAY

Fibre cement board to AS/NZS 2908.2 manufactured from cellulose fibre, Portland cement, sand and water, or glass-mat gypsum board manufactured from gypsum core with coated fiberglass mat facing.

Levelling compounds

2.2 FIBERPLAN

Cement-based, fibre-reinforced, self-levelling compound for thicknesses from 3mm to 10mm.

2.3 ULTRAPLAN RENOVATION

Cement-based, fibre-reinforced, self-levelling compound for thicknesses from 3mm to 40mm.

2.4 ULTRAPLAN ECO

Cement-based, self-levelling smoothing compound for thicknesses from 1mm to 10mm.

2.5 NIVORAPID

Cement-based, thixotropic levelling mortar for thicknesses from 3mm to 20mm.

2.6 NIVORAPID & LATEX PLUS

Cement-based, thixotropic levelling mortar with flexible polymer water dispersion for thicknesses from 3mm to 20mm.

2.7 PLANITOP SMOOTH & REPAIR R4 ZERO

Cement-based, fibre reinforced levelling mortar for thicknesses from 3mm to 40mm.

2.8 PLANITOP FAST 330

Cement-based, fibre-reinforced levelling mortar with synthetic resin additives, for thicknesses from 3 to 30mm.

2.9 UC LEVELLER

Cement-based, self-levelling compound for thicknesses from 3mm to 70mm.

2.10 MAPECEM

Cement-based, rapid setting hydraulic binder for shrinkage-compensated screeds.

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2.11 MAPECEM PRONTO
Cement-based, pre-mixed, rapid setting shrinkage compensated screed.

2.12 TOPCEM
Cement-based, hydraulic binder for shrinkage-compensated screeds.

2.13 PLANICRETE
Synthetic-rubber latex additive for use with cement based screeds and adhesives to improve mechanical and adhesive characteristics.

Primers

Waterproofing membrane

2.14 PRIMER 3296
Acrylic polymer based primer in water dispersion for porous substrates.

2.15 ECO PRIM T PLUS
Acrylic resin primer in water dispersion.

2.16 ECO PRIM GRIP PLUS
One component synthetic resin primer in water dispersion.

2.17 PLANISEAL MR
Two component water based epoxy primer/barrier hydrostatic resistant coating.

Adhesives

2.18 GRANIRAPID
Two component, cementitious adhesive with synthetic rubber latex. Classified C2FS1 to ISO 13007.1.

2.19 KERAQUICK MAXI S1
Cementitious adhesive. Suitable for application in layers up to 15mm thick. Classified C2FTS1 to ISO 13007.1.

2.20 KERAQUICK MAXI S1 & LATEX PLUS
Cementitious adhesive with flexible polymer water dispersion. Suitable for application in layers up to 15mm thick. Classified C2FS2 to ISO 13007.1.

2.21 KERABOND PLUS & ISOLASTIC
Cementitious adhesive with elastic polymer water dispersion. Classified C2TS2 to ISO 13007.1.

2.22 KERALASTIC T
Two component, polyurethane adhesive. Classified R2T to ISO 13007.1.

2.23 KERAFLEX MAXI S1 ZERO
Cementitious adhesive with synthetic resin. Classified C2TES1 to ISO 13007.1.

2.24 KERAPOXY ADHESIVE
Two component epoxy adhesive. Classified R2T to ISO 13007.1.

2.25 ADESILEX P10 & ISOLASTIC FOR MOSAICS
Two component cementitious adhesive with elastic polymer water dispersion. Classified C2TES1 to ISO 13007.1.

2.26 ULTRALITE S1 FLEX ZERO
One component cementitious adhesive with synthetic resin. Classified C2TES1 to ISO 13007.1.

2.27 ULTRALITE S2 T FLEX
One component thixotropic cement and synthetic resin based adhesive. Classified C2ES2 to ISO 13007.1.

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Grouts

2.28 ULTRACOLOR PLUS

Cement-based, polymer-modified grout for joints from 2mm to 10mm, with water repellent DropEffect and anti-mould with BioBlock technologies.

2.29 KERAPOXY

Two component, chemical resistant epoxy grout for joints 3mm to 10mm wide. Classified RG to ISO 13007.3.

2.30 KERAPOXY EASY DESIGN

Two component, chemical resistant epoxy grout with anti-mould BioBlock technology for joints 3mm to 15mm wide. Classified RG to ISO 13007.3.

Components - waterproofing

2.31 MAPEBAND SA TAPE

Alkali resistant butyl self-adhesive waterproofing tape, 100mm wide roll.

2.32 MAPEBAND SA GASKET

Alkali resistant butyl self-adhesive waterproofing gasket, 370mm x 370mm square.

2.33 MAPEBAND EASY TAPE

Alkali resistant rubber waterproofing tape with a non-woven fabric face and back, 130mm wide roll.

2.34 MAPEBAND EASY GASKET

Alkali resistant rubber waterproofing gasket with a non-woven fabric face and back, available 200mm x 200mm and 400mm x 400mm square.

2.35 MAPENET 150 REINFORCING MESH

Alkali-resistant fiberglass reinforcing mesh.

2.36 MAPETEX SEL REINFORCING FABRIC

Alkali resistant non-woven polypropylene reinforcing and anti-fracture fabric.

2.37 MAPEGUM WPS

One component synthetic resin-based paste in water dispersion liquid waterproofing membrane. Grey colour.

2.38 MAPELASTIC AQUADEFENSE

One component synthetic resin-based paste in water dispersion liquid waterproofing membrane. Light blue colour.

2.39 MAPELASTIC SMART

Two component flexible cementitious liquid waterproofing membrane.

Components - anti-fracture membrane

2.40 MAPEGUARD 2 ANTI-FRACTURE MEMBRANE

1mm thick, semi-rigid reinforced fabric, self-adhesive, crack isolation membrane for in plane cracks up to 10mm wide.

Components - sound control

2.41 ULTRABOND ECO V4 EVOLUTION ADHESIVE

Synthetic polymer-based adhesive.

2.42 MOVEMENT JOINT - INSERT

Polyurethane or neoprene insert. Refer to SELECTIONS.

2.43 MOVEMENT JOINT - BACKING ROD

Polyethylene foam (PEF) backing rod. Refer to SELECTIONS.



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2.44 MAPESONIC STRIP
Expanded polyethylene strip roll, 3mm thick x 50mm high.

2.45 MAPESONIC CR SOUND CONTROL MEMBRANE
Rubber and cork soundproofing membrane, 4mm thick.

Components - cleaning

2.46 ULTRACARE KERANET EASY
Acid-based, pre-mixed general tile and grout cleaner.

2.47 ULTRACARE KERAPOXY CLEANER
Concentrated liquid detergent for removing epoxy grout.

Accessories

2.48 UNDERTILE HEATING
Proprietary electric undertile heating system complete with thermostat/controller.
Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for undertile heating.

2.49 TRIMS
Tile trim, edge strips, floor finish divider strips and weather bars. Available in aluminium, brass and stainless steel. Refer to SELECTIONS.

2.50 MOVEMENT JOINT - ANGLE
Metal or PVC angle. Refer to SELECTIONS.

2.51 MOVEMENT JOINT - SILICONE SEALANT
One part, flexible silicone sealant, Mapesil AC for acetic cure or Mapesil LM for neutral cure. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS
Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

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

3.3 PRE-INSTALLATION REQUIREMENTS
Check work previously carried out and confirm it is of the required standard for this part of the work.

Moisture content concrete:	75% maximum relative humidity, minimum 28 day cured
Moisture content plywood:	18% maximum
Moisture content particleboard:	16% maximum

3.4 STANDARDS AND TOLERANCES
Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 APPLY LEVELLING COMPOUND
Mix levelling compound to Mapei instructions. Trowel onto prepared substrate to required thickness and fall, where required:

1:40 minimum	deck acting as a roof to NZBC E2/AS1
1:40 minimum	accessible showers to NZBC G1/AS1
1:50 minimum	shower bases to NZBC E3/AS1

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1:50 minimum	shower bases for people with disabilities to NZS 4121
1:50 minimum	food processing areas (e.g. commercial kitchens) to G3/AS1
1:50 minimum	cross fall for outdoor accessways in public areas to NZS 4121

3.6 SOUND CONTROL SYSTEM

Lay self-adhesive Mapesonic Strip along base of wall to entire perimeter of room and around columns. Spread Ultrabond Eco V4 Evolution adhesive to prepared substrate with a trowel. Lay Mapesonic CR with edges butted. Working in rows lengthwise, fold back half of the underlay width and trowel flooring adhesive. Unfold the underlay and press into adhesive.

Trim the Mapesonic Strip flush with the finished tiled surface when installed.

Installation/application

3.7 FIBRE CEMENT UNDERLAY

Lay and fix flooring underlay to the manufacturer's instructions. Fill gaps between sheets and corners with a neutral cure silicone sealant.

3.8 ADHESIVE APPLICATION GENERAL

For general floor tiling, use a 10mm x 10mm x 10mm notched trowel.

For large format tiles, use a 12mm x 12mm x 12mm notched trowel.
For mosaics, use a 4.5mm x 4.5mm x 4.5mm notched trowel.

3.9 INSTALL TRIM

Press trim into wet adhesive.

3.10 INSTALL MOVEMENT JOINT ANGLE

Press angle into wet adhesive.

3.11 LAY TILES

Firmly press tiles into the adhesive bed for full contact between tile and adhesive with no voids. Butter the back of tiles with ribbed underside before laying into adhesive bed by spreading a thin layer of adhesive on the back of the tile to AS 3958.1. Remove a tile periodically during installation to check for correct adhesive coverage. Allow for grout joints between laid tiles to tile manufacturer's recommended width. Do not fix tiles over skinned adhesive. Promptly remove surplus adhesive from the tile surface.

3.12 APPLICATION GENERALLY

To AS 3958.1, Mapei technical data sheets, and to WMAI CoP recommendations. Surfaces to be clean, sound and free of dust, oil, grease, curing compounds or release agents.

3.13 APPLY PRIMER

Brush or roll primer over surface.

3.14 ANTI-FRACTURE MEMBRANE

When applied primer is clear in colour and tacky, lay Mapeguard 2 membrane over the prepared substrate. Peel back film of self-adhesive underside of membrane in short sections and roll over with a weighted roller to bond the membrane to the substrate.

3.15 INSTALL UNDERTILE HEATING

Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for installation of undertile heating.

3.16 APPLY WATERPROOFING MEMBRANE

Reinforce corners and penetrations with waterproofing tape. Mix waterproofing components to Mapei instructions. Trowel, brush or roll on liquid waterproofing membrane over prepared surface. Apply two coats to achieve required minimum total dry film thickness to Mapei product technical data sheet.

3.17 SETTING OUT

Confirm tile layout and bond pattern. Cut tiles to tile manufacturer's recommendations. Lay tiles level, maintaining falls to drainage where required (e.g. floor wastes). Provide joint widths to the tile manufacturer's recommendations.

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3.18 MOVEMENT JOINTS GENERAL

Provide movement joints to AS 3958.1:

Depth:	Movement joints to go right through the tile and bed to the background.
Width:	6mm
Locations:	At junctions with floors, columns, nibs, and similar. Around sanitary fixtures. Around fixtures interrupting the tile surface (e.g. at junctions with joinery fixtures, window/door frames, and built in cupboards). At changes in substrate.
Large areas:	Provide joints at not less than 4.5 metres spacing in both directions for internal floors. Provide joints at not less than 3.5 metres spacing in both directions for external floors. Provide joints over existing joints in the substrate.

3.19 APPLY ADHESIVE

Mix adhesive to Mapei instructions. Spread adhesive over prepared surface with a notched trowel to Mapei recommended bed thickness.

3.20 APPLY GROUT

Mix grout to Mapei instructions. Work grout into joints with a rubber trowel to AS 3958.1. Allow the grout to firm up in the joint before wiping tile surface with a damp, dense sponge.

3.21 INSTALL MOVEMENT JOINT INSERT

Place insert between movement joint angles.

3.22 INSTALL MOVEMENT BACKING ROD & SEALANT

Place PEF backing rod into movement gap. Apply a continuous bead of silicone sealant over PEF backing rod.

Completion & Commissioning

3.23 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 TILES

Location:	Refer to Architectural Plans
Supplier:	Contractor to confirm
Type:	Contractor to confirm
Class:	Class 2 - residential floor/wall tiles (suitable for light traffic e.g. bedrooms, bathrooms, hallways)

4.2 MAPEI INTERNAL TILING SYSTEM OVER CONCRETE FLOOR - WET AREA

Location:	Refer to Architectural Plans
Supplier:	MBP (NZ) Ltd.
Substrate:	Concrete
Levelling:	Contractor to confirm
Primer:	Contractor to confirm
WPM:	Mapelastic Aquadefense
Adhesive:	Contractor to confirm
Grout:	Contractor to confirm
Grout colour:	Contractor to confirm

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6411 VINYL SURFACING

1 GENERAL

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

- PVC sheet
- PVC tiles

1.1 RELATED WORK

Refer to Architectural Plans

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC D1/AS1	Access routes
NZS/AS 1884	Floor coverings - Resilient sheet and tiles - Installation practices
BPS	Building Product Specifications

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Contractor to supply

Manufacturer/supplier contact details

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

~ years:	For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 years:	For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.7 NO SUBSTITUTIONS

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

Performance

Performance - Slip resistance

1.8 TEST - SLIP RESISTANCE

Test walking surfaces for slip resistance, refer to SELECTIONS for test condition.

2 PRODUCTS

Materials

2.1 VINYL SHEET

High vinyl content homogeneous monolayer flexible PVC sheet flooring.

2.2 VINYL TILES

High vinyl content monolayer flexible PVC tiles.

2.3 COVINGS

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

2.4 VINYL SHEET WALL COVERING

High vinyl content homogenous flexible PVC sheet wall covering.

2.5 WALL AND FLOOR VINYL JOINING STRIP

White PVC floor to wall finishing strip.

2.6 TRIMS AND EDGING

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

Accessories

2.7 ADHESIVE

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

2.8 PRIMER AND SEALER

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

2.9 FLOOR LEVELLING COMPOUND

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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

Avoid distortion, stretching, marking and damage to edges while shifting, unrolling and handling sheet, tiles and accessories.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with NZS/AS 1884. Appendix A and for pH for concrete substrates in accordance with NZS/AS 1884. Appendix B. Do not commence laying vinyl until readings for the whole area are within acceptable levels as follows:

Moisture content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH
pH:	Concrete substrate 9-10pH

3.4 BEFORE COMMENCING WORK

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

3.5 PREPARATION

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

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the installation.

3.7 LAYING GENERALLY

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

3.8 LAYOUT

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

Application - General / substrate preparation

3.9 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.10 PREPARATION NEW CONCRETE

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust.

3.11 PREPARATION, NEW PLYWOOD OR PARTICLEBOARD

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind smooth, then vacuum to remove all dust.

3.12 PREPARATION FOR WALL LININGS

Prepare wall linings to requirements of wall lining manufacturer and vinyl manufacturer,for vinyl over.

3.13 INSTALL FLOOR LEVELLING COMPOUND

Install floor levelling compound in accordance with manufacturer’s requirements.

3.14 APPLY PRIMER OR SEALER FOR VINYL SHEET

Prime and/or seal porous plaster, concrete and timber substrates to the adhesive manufacturer's requirements.

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Application - laying

3.15 ADHESIVE APPLICATION

Apply approved adhesive as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

3.16 LAYING VINYL SHEET

Roll out, cut, leave to condition and install sheet vinyl to the vinyl manufacturer's requirements. Ensure there are no air bubbles or twisting, that the seams are kept clear of adhesive, and immediately the sheet is adhered roll with a 68 kg roller.

3.17 THERMO-WELDING VINYL SHEET

Machine groove and thermo-weld all seams in specified areas, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

3.18 CROSS JOINS

Plan and allow cuts to avoid cross joins. Obtain written approval of the owner before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.

3.19 COVE VINYL

Pencil cove flooring to the specified height and finish off as detailed.

3.20 MITRES

Perform butterfly method to internal and external mitres. Thermo-weld all mitres.

3.21 VINYL TO STAIRCASES

Fit selected nosing to each tread and at the top of each stair flight, in accordance with the nosing manufacturer's requirements. Lay pre-cut vinyl sheets to each tread and riser, pencil coved at the rear of each tread.

3.22 LAYING VINYL TILES

Set out from the centre of the area in two preparatory runs and modify to suit before laying tiles from the centre to the vinyl manufacturer's requirements. Ensure air is expelled and, as each section is completed, immediately roll with a 68 kg roller. Complete sections before scribing the perimeter tiles.

3.23 FIT VINYL SKIRTING

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

3.24 FIT VINYL EDGING

Fit tapered vinyl edging to all borders, except where abutting carpet.

3.25 WALL SURFACES

Clean off surface contamination, carry out minor repairs and bring to a smooth, even surface.

3.26 FLOOR TO WALL FINISHING STRIP

Adhere to walls in a true, straight line using contact adhesive. Roll immediately using a seam-roller to ensure maximum bond strength is achieved.

3.27 APPLY VINYL WALL SHEET

Apply sheet to walls and heat weld seams under the technical direction of the wall sheet manufacturer's representative for each particular location.

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

Cut vinyl neatly to recess on the floor/wall finishing strip and chemically weld this joint using Werner Mueller, type C welding compound.



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3.28 THERMO-WELD VINYL WALL SHEET

Hand groove and thermo-weld all seams, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

Cleaning

3.29 CLEAN VINYL

Leave vinyl flooring surfaces free of adhesive, dirt and debris. Clean and finish vinyl to manufacturer's requirements.

Completion

3.30 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 VINYL FLOORING

Location:	Refer to Architectural Drawings, Finishes Plan.
Manufacturer/brand:	Contractor to confirm
Colour/number:	Contractor to confirm
Size/Gauge:	Contractor to confirm

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6511 CARPETING

1 GENERAL

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

- carpet underlay
- woven sheet carpet

1.1 RELATED WORK

Refer to Architectural Plans

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2270	Plywood and blockboard for interior use
AS/NZS 2455.1	Textile floor coverings - Installation practice - General
BPS	Building Product Specifications

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Contractor to supply

Manufacturer/supplier contact details

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year:	For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year:	For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.7 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.8 NO SUBSTITUTIONS

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

2 PRODUCTS

Materials

2.1 UNDERLAY

To AS/NZS 2455.1 Soft underlay and underlays manufacturer's requirements.

Refer to SELECTIONS for product selection.

2.2 CARPET

To AS/NZS 2455.1 Textile floor coverings.

Refer to SELECTIONS for product selection.

Components

2.3 BINDER BARS

Anodised aluminium section with fluted face.

2.4 DIVIDER STRIPS

Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.

2.5 EDGE GRIPPER

Timber/plywood to AS/NZS 2270 with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

Accessories

2.6 ADHESIVE, UNDERLAY

To AS/NZS 2455.1, clause 1.5.3. and underlay manufacturer's requirements.

2.7 ADHESIVE, CARPET

To AS/NZS 2455.1, clause 1.5.3. and carpet manufacturer's requirements.

2.8 TAPE

To carpet manufacturer's requirements.

2.9 FLOOR LEVELLING COMPOUND

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

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3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Ensure all fittings and fixtures around which the carpet is to be scribed are in place. Carry out such additional preparatory work as required in bringing the substrate to suitable condition.

Confirm moisture content of substrate in accordance with AS/NZS 2455.1. Appendix B Do not commence laying carpet until readings for the whole area are within acceptable levels as follows:

Moisture Content:	Timber substrate - 8 -12% for air conditioned buildings - 10 -14% for intermittently heated buildings - 12 -16% for unheated buildings
	Concrete substrate 75%RH

3.4 BEFORE COMMENCING WORK

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

3.5 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.7 TAPE

Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

3.8 LAYING GENERALLY

Carry out the whole of the work to AS/NZS 2455.1 and to the flooring manufacturer's requirements.

3.9 LAYOUT

Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

Application - general / substrate preparation

3.10 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.11 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

3.12 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed.

Application - carpet laying

3.13 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.14 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to AS/NZS 2455.1, section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

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3.15 LAYING TO STAIRS

Install on stairs in accordance with AS/NZS 2455.1.

3.16 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

Completion

3.17 PROTECTION

Provide the following temporary protection of the finished work.

3.18 SPECIAL PROTECTION

Self Adhesive carpet protective film: if required to protect the carpet surface from later trades' operations.

3.19 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 CARPET & UNDERLAY

Location	Brand	Type/thickness/weight
Refer to Architectural Plans, Finishes Plan	Contractor to confirm	Conventionally (stretched)

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

1.4 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.



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1.7 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to WorkSafe: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.8 MATERIAL SAFETY DATA SHEET

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

Warranties

1.9 WARRANTY

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

2 years: Warranty period

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

Performance

1.10 MANUFACTURER'S INSPECTION

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

1.11 INSPECTION OF WORK

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

2 PRODUCTS

Materials

2.1 PAINT TYPES

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

2.2 MATERIALS GENERALLY

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

2.3 THINNERS AND ADDITIVES

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

Accessories

2.4 FILLERS

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

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3 EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

3.2 CORROSION PROTECTION SUPERVISION FOR STRUCTURAL STEEL

To AS/NZS 5131, 9.9.20, for corrosion protection of structural steel. Provide an Inspection and Test Plan (ITP) to AS/NZS 5131, 13.9.1, prior to commencement.

Corrosion protection painting to be supervised by a competent person.

3.3 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.4 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.5 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.6 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.7 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.8 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.9 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior
For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.
Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior
For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.
Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.10 ANCILLARY SURFACES

The coatings listed in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

3.11 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

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3.12 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products

3.13 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.14 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.15 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

3.16 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.17 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.18 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.19 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.20 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - unpainted masonry

3.21 PREPARING BRICKS

Remove loose dirt, sand, aggregate and mortar by brushing down or blocking-off surface with a flat stone, hose with clean water. Fill holes with mortar/acrylic based filler. Remove efflorescence by dry brushing with a stiff bristle brush. Brickwork that has been acid cleaned shall have the pH tested to ensure it is neutralized before painting.

3.22 PREPARING CONCRETE

Remove grease and formwork oil with solvent or water and household detergent. Wash with clean water and allow to dry. Fill unwanted holes with cement grouting and allow to cure. Remove loose surface material and surface projections with a flat stone. Roughen slightly dense or glazed surfaces with light (30 mesh) sandblasting, rubbing with coarse abrasive stones, or by wetting the surface and treating with 10% commercial hydrochloric acid solution. Allow to react for 5 minutes, scour surface with a stiff bristle brush, wash off with clean water and allow to dry. Remove efflorescence by dry brushing or by wetting the surface and treating with 10% commercial hydrochloric acid solution as above.

Remove dust and dirt by brushing, air blast, hosing, or scrubbing as may be necessary.

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3.23 PREPARING CEMENT PLASTER

Ensure surface is adequately cured and dry. Treat mould with one part sodium hypochlorite household bleach to three parts clean water solution or a proprietary anti-mould solution, and allow to dry. Remove efflorescence by brushing only.

3.24 PREPARING CONCRETE MASONRY

Remove loose dirt, sand, aggregate and mortar by brushing down or blocking-off the surface with a flat stone or hardwood block. Fill holes with mortar or acrylic based filler. Treat mould with one part sodium hypochlorite household bleach to three parts clean water solution, or a proprietary anti-mould solution, and allow to dry.

Remove efflorescence by dry brushing or by wetting the surface and treating with 10% commercial hydrochloric acid solution. Allow to react for 5 minutes, scour the surface with a stiff bristle brush, wash off with clean water and allow to dry.

Remove dust and dirt by brushing, air blast, hosing or scrubbing.

Preparation - gypsum plaster

3.25 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - unpainted linings

3.26 PREPARING FIBROUS PLASTER

Check for and remove release agents and other contaminants by washing with clean water or solvent and allow to dry. Fill cracks and surface imperfections with patching plaster and lightly sand smooth. Remove dust.

3.27 PREPARING PLASTERBOARD

Check that joints are prepared to a smooth level surface finish. Fill cracks and surface imperfections with the sheet manufacturer's required stopping compound and lightly sand smooth. Remove dust.

Preparation - painted surfaces generally

3.28 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.29 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water. Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.30 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty. Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Preparation - painted surfaces in good condition

3.31 PREPARING SURFACES

Wash down surfaces with either:



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- a chlorine based solution; or
- 5-10 millilitres of ordinary household detergent to 1 litre of warm water; or
- a solution of 30 grams of trisodium phosphate to 1 litre of water

Replace solutions frequently and finally wipe over a second time with a clean absorbent cloth.

For surfaces containing heavy smoke and grease deposits, wash down with either:

- mineral turpentine; or
- a 5% solution of ammonia; or
- a 1:40 solution of sugar soap and water

as necessary to remove the deposits. Wipe over with a clean absorbent cloth.

Prepare coatings which have chalked by sanding, brushing, waterblasting or other methods as appropriate.

Lightly sand glossy surfaces to ensure good adhesion of the coatings.

Application - before applying final coatings

3.32 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.33 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP. treated joinery has dried sufficiently to lose odour.

3.34 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.35 CONCEALED METAL SURFACES

Apply primer to suit the coating system to all metal surfaces which will be concealed when incorporated into the building.

3.36 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.37 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.38 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally

3.39 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.40 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.41 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the

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necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.42 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.43 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of the paint manufacturer and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.44 DRYING TIME

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

3.45 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.46 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.47 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

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

Completion

3.48 CLEAN

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

3.49 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal.

3.50 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

3.51 REMOVE

Remove dropsheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

3.52 REPLACE HARDWARE

Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

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4 SELECTIONS

4.1 SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

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7120 HOT & COLD WATER SYSTEM

1 GENERAL

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

1.1 RELATED WORK

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC G4/AS1	Ventilation of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity.
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation

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AS 3688	Water supply and gas systems - metallic fittings and end connectors
AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings
AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006
NZ Backflow Testing Standard: NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

1.3 MANUFACTURER DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.4 WARRANTY

Provide warranty for:

2 years:	For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.5 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

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Provide this information prior to practical completion.

1.7 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled institutions.
- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

1.8 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.

- Test to a pressure of1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

1.9 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1 as modified by NZBC G12/AS3, Section 17, Testing and commissioning, for cold water.

- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 17.3.1 Hydrostatic test. Test storage tanks to AS/NZS 3500.1, 17.3.2 Storage tanks (except rain water tanks).

and

AS/NZS 3500.4 as modified by NZBC G12/AS3, Section 9, Testing and commissioning, for hot water.

- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9.3 Testing. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 Testing.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

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2 PRODUCTS

2.1 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

Materials

2.2 COPPER PIPE

To NZBC G12/AS1, 2 Materials. Copper pipe to NZS 3501, AS 1432 (type A, B & C) and AS 3688 for fittings.

2.3 PVC-U PIPE

To NZBC G12/AS1, 2 Materials. PVC-U pipes and fittings to AS/NZS 1477 and PVC-U solvent cements and primers to AS/NZS 3879. Protect from sunlight. For cold water applications only.

2.4 WATER METER

To the requirements of the network utility operator.

2.5 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.6 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/AS1, 3.4 Backflow protection & 3.5 Containment Backflow protection and NZBC G12/AS1, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection

2.7 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

2.8 HEADER TANKS

Pre-formed black polyethylene or stainless steel tank, complete with access opening and lid and overflow tray.

2.9 EXPANSION VESSEL

Expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4 5.9 Valves and expansion vessels.

Materials - Hot water heating appliances

2.10 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305 NZS 4606.1, NZS 4606.2 and NZS 4606.3, electric water storage cylinder, insulated and complete with required fittings.

2.11 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Continuous flow unit with an integral gas burner and flue to NZS 4305.

Components

2.12 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZS 4305 and AS/NZS 3500.4.

2.13 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

Fire stopping accessories

2.14 FIRE STOPPING SYSTEMS

For sealing around pipe penetration through fire walls and floors use a combination of the following:

- Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire



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resistance rating of the floor or wall.
- Two-part silicone foam elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- Fire wrap containing intumescent material used in conjunction with the selected sealer.
- Fire collar with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

Refer to SELECTIONS for requirements.

3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

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

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1 and AS 4809.

3.11 JOINTING PVC-U PIPE

Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to NZBC G12/AS1 and AS/NZS 2032.

3.12 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

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3.13 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

3.14 JOINTING STAINLESS STEEL PIPE

Proprietary stainless steel fittings to NZBC G12/AS1 and pipe system manufacturer's requirements.

Application - Pipework installation

3.15 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.16 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.17 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or G12/AS1.

3.18 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures as required by NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

3.19 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

3.20 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation or NZS 4607 for Valve-vented systems.

3.21 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.22 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZS 4305 , AS/NZS 3500.4, section 8.2 Thermal insulation, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.23 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11 or NZS 4607 for Valve-vented systems.



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3.24 INSTALL WALL-MOUNTED BOILING CYLINDER
Install to the cylinder manufacturer's stated requirements. Locate where shown.

3.25 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY
Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.26 INSTALL TEMPERING VALVE
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.27 INSTALL EXPANSION VESSEL
Install expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4, 5.9 Valves and expansion vessels.

3.28 PENETRATIONS
Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Application - Fire stopping work

3.29 FIRE STOPPING WORK
Make and prepare pipe penetration to suit fire stopping and install fire stopping system around pipes to manufacturer's installation instructions.

Installation - Valves

3.30 INSTALLING BELOW GROUND ISOLATING VALVE
Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.31 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED
Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

3.32 INSTALLING BACKFLOW PREVENTION DEVICE
Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.33 LABEL
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.34 CLEAN IN-LINE FILTER
Clean all in-line filters on completion of works.

3.35 REPLACE
Replace damaged or marked elements.

3.36 LEAVE
Leave work to the standard required by following procedures.

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

4 SELECTIONS

Water main

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

Pipework

4.2 COPPER PIPE

Manufacturer/Brand: Plumbing contractor to select
Nominal bore: 20mm
Wall thickness: 90mm

4.3 PVC-U PIPE

Manufacturer/Brand: Plumbing contractor to select

Hot water systems

4.4 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand: Main contractor to confirm
Model size: 300L, Refer to Architectural drawings: Plumbing/Drainage plan.

Valves and accessories

4.5 MAIN ISOLATING VALVE

Location: Cupboard, by HWC
Brand/type: Plumbing contractor to select

4.6 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance: Washing machine
Brand/type: Refer to tapware selections

4.7 TEMPERING VALVE

Location: Cupboard, by HWC
Brand/type: Plumbing contractor to select

4.8 BACKFLOW PREVENTION DEVICE

Location: Boundary / Water meter box
Brand/type: Plumbing contractor to select



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7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Metalcraft Roofing** rainwater disposal systems including gutters fascias and downpipes.

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.3 DOCUMENTS

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

NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Are available on the website or by contacting Metalcraft Roofing.

For technical assistance contact **Metalcraft Roofing**

Web: www.metalcraftroofing.co.nz

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years:	Failure of coating adhesion (manufacturer's standard warranty)
10 years:	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

3 years	For workmanship

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

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Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 NO SUBSTITUTIONS

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

1.8 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **MetalcraftRoofing** materials and the techniques specified.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Metalcraft Roofing** maintenance information on completion of the roofing work.

Performance

1.10 TEST - NZBC E1/AS1

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with NZBC E1/AS1.

2 PRODUCTS

Materials

2.1 FASCIA SYSTEM

Metalcraft fascia system complete with custom fixing bracket to suit. Available in Fascia 135, Fascia 155 and Fascia 185.

2.2 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

2.3 DOWNPIPES - METAL

Metalcraft metal downpipes, circular or rectangular. Refer to SELECTIONS.

Components

2.4 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

2.5 DOMES

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

2.6 GUTTER MESH

Flexible plastic mesh fitted into the gutter to the mesh manufacturer's requirements.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

Check that fascia, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

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3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL GUTTER AND FASCIA

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 600mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to Metalcraft Roofing details and NZMRM CoP recommendations.

3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. All installation to Metalcraft Roofing details and NZMRM CoP recommendations, section 5.7,Outlets & Downpipes.

3.7 INSTALL PROTECTION

Fit wire mesh domes to downpipe outlets and plastic mesh to spouting to the spouting manufacturer's requirements.

Completion

3.8 REPLACE

Replace damaged or marked elements.

3.9 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 METALCRAFT ROOFING GUTTER SYSTEMS

Profile:	125 Quarter Round gutter
Base material:	steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	Contractor to confirm

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4.2 METALCRAFT METAL DOWNPIPES

Profile:	Round
Size:	80mm and 100mm diameter
Material:	Steel
BMT:	0.55mm
Coating system:	COLORSTEEL® Maxam™
Colour:	Contractor to confirm

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7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7150 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

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

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER DOCUMENTS

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

Contractor to supply

Copies of the above literature are available by phoning.

1.4 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

Stainless steel pipe and associated fittings
PVC,PE polyethylene or polypropylene pipe including all associated fittings.

2.3 FIRE STOPPING SYSTEMS

For sealing around pipe penetration through fire walls and floors use singularly or combinations of the following:

- Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- Two-part silicone foam elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- Fire wrap containing intumescent material used in conjunction with the selected sealer.
- Fire collar with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

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Refer to SELECTIONS for requirements.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to NZBC G13/AS1 and NZBC G1/AS1 and complete all tests to G13/AS1, 7.1 Test Methods.

3.2 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.3 ELECTROLYTIC ACTION

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

3.4 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to ensure metallic waste pipes connected to metallic drains and attached metallic sanitary fixtures using an earth bonding conductor to requirements of AS/NZS 3000, 5.6 Equipotential bonding.

3.5 INSTALL TRAPS, WASTE AND VENT PIPES - NZBC G13/AS1

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1 and jointing for PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.6 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2, as modified by NZBC G13/AS3, and jointing to PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.7 INSTALL ELECTRIC PAN VENTS

Install electric pan vents to manufacturers' requirements. Leave ready for electrical connection by electrician.

3.8 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.9 FIRE STOPPING WORK

Make and prepare pipe penetration to suit fire stopping and install fire stopping system around pipes to manufacturer's installation instructions.

3.10 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations,as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.11 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

Brand/type: Plumbing contractor to select

4.2 EXPOSED PIPES AND TRAPS

Brand/type: Plumbing contractor to select



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4.3 FLOOR WASTES

Manufacturer: Plumbing contractor to select
Brand/type: Plumbing contractor to select
Grate/finish: Plumbing contractor to select



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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 MANUFACTURER'S DOCUMENTS

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

Contractor to supply

Copies of the above literature are available from

Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

1.3 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

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1.4 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

Components

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

Underground PVC-U pipe to be classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 POLYETHYLENE PIPES

Polyethylene pipes and fittings to AS/NZS 5065.

2.5 PERFORATED PIPE - SUBSOIL DRAINAGE

Perforated corrugated coil high density polyethylene subsoil drainage pipe to AS 2439.1 with polypropylene filter sock over, for groundwater drainage.

2.6 GULLY TRAPS - NZBC G13/AS2

To NZBC G13/AS2: 3.3 Gully traps, complete with grating.

2.7 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

2.8 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.9 STRIP DRAIN CHANNEL

Proprietary, modular, variable invert, plastic, steel (various types), or polymer concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

2.10 INSPECTION COVERS

Cast iron frame with screw-down cover.

Foul water

2.11 TRENCH BACKFILLING MATERIAL, FOUL WATER - NZBC G13/AS2

Bedding and backfilling material to NZBC G13/AS2, 2.0 Materials**,** for methods shown in NZBC G13/AS2, figure 7, Bedding and backfilling.

2.12 TRENCH BACKFILLING MATERIAL, FOUL WATER - AS/NZS 3500.2

Bedding and backfilling material to AS/NZS 3500.2, 5.4, Bedding of drains, and for concrete, if required, AS/NZS 3500.2, 5.3 Concrete Support.

Surface water

2.13 TRENCH BACKFILLING MATERIAL, SURFACE WATER - NZBC E1/AS1

Bedding and backfilling material to NZBC E1/AS1, 3.9 Bedding and backfilling, figure 13.

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2.14 TRENCH BACKFILLING MATERIAL, SURFACE WATER - AS/NZS 3500.3

Bedding and backfilling material to AS/NZS 3500.3, section 6.2.10, 6.2.11 and 6.3.5, as modified by NZBC E1/AS2.

Subsoil

2.15 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Free draining crushed stone, 7 mm to 20 mm in size.

Concrete masonry retaining walls

2.16 DRAINAGE MATERIAL - SIMPLE STANDALONE CONCRETE MASONRY RETAINING WALLS

Free draining imported hardfill to the NZTA F2 specification.

Filter material comprised of clean, durable stone having a crushing resistance of not less than 100 kN when tested in accordance with NZS 3111, or a mixture of such material with clean hard sand. The filter material when tested in accordance with NZS 4402, shall comply with the following gradings:

TEST SIEVE APERTURE	PERCENTAGE PASSING
26.5mm	100
13.2mm	85-100
9.5mm	80-95
4.75mm	65-85
2.36mm	50-70
1.18mm	35-55
600µm	18-40
300µm	3-25
150µm	8 maximum
75µm	0

Accessories

2.17 FILTER FABRIC

Polymeric fabric formed from a plastic yarn or a long chain synthetic polymer composed of at least 85% by weight of propylene, ethylene, amide, ester or vinylidene chloride. Fibres to be rot proof, chemically stable and have low water absorbency. The filter network, (woven or non-woven) must be dimensionally stable and resistant to delamination.

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3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.
Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, Proximity of Trench to Building, for stormwater and subsoil drains.
- AS/NZS 3500.3, 6.2.8, Installation near and under buildings, as modified by NZBC E1/AS2.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

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

3.3 FOUL WATER DRAINAGE GENERALLY - NZBC G13/AS2

Carry out foul water drainage work to NZBC G13/AS2 and NZBC G1/AS1 and complete all tests to NZBC G13/AS1, 7.1 Test Methods.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033.

3.4 FOUL WATER DRAINAGE GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2 and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033.

3.5 SURFACE WATER DRAINAGE GENERALLY - E1/AS1

Carry out stormwater drainage work to NZBC E1/AS1, and complete all tests to NZBC E1/VM1, 8.0 Drain Leakage Tests.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032, AS/NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and AS/NZS 2566.1.

3.6 SURFACE WATER DRAINAGE GENERALLY - AS/NZS 3500.3

Carry out stormwater drainage work to AS/NZS 3500.3, and complete all tests to AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032, AS/NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and AS/NZS 2566.1.

3.7 LAY FOUL WATER DRAINS

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

3.8 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to NZBC G13/AS2, 3.3 Gully traps.

3.9 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to AS/NZS 3500.2, section 4.6, Gullies.

3.10 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

3.11 INSTALL STRIP DRAIN CHANNEL

Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.

3.12 INSTALL SURFACE WATER SUMP

To NZBC E1/AS1 or to AS/NZS 3500.3 section 7 as modified by NZBC E1/AS2, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.13 INSTALL STORMWATER INSPECTION CHAMBERS

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Construct as detailed on a poured concrete footing to NZBC E1/AS1, 3.7, Access for maintenance, or to AS/NZS 3500.3, section 7 as modified by NZBC E1/AS2. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.14 INSTALL FOUL WATER INSPECTION CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing to NZBC G13/AS2, 5.7 Access points. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.15 INSTALL FOUL WATER INSPECTION CHAMBERS - AS/NZS 3500.2

Construct as detailed on a poured concrete footing to AS/NZS 3500.2, 4.7 Inspection openings and 4.8 Inspection chambers, as modified by NZBC G13/AS3. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

3.16 SOAKHOLES OR TRENCHES

Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.

3.17 TESTING - FOUL WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.18 TESTING - SURFACE WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC E1/VM1, 8.0 Drain Leakage Tests or AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Backfilling and encasement - Foul water and surface water

3.19 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

3.20 TRENCH BACKFILLING GENERALLY - FOUL WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.21 TRENCH BACKFILLING GENERALLY - SURFACE WATER - NZBC E1/AS1

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

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3.22 TRENCH BACKFILLING GENERALLY - SURFACE WATER - AS/NZS 3500.3

Trench fill to be placed in loose layers not more than 200 mm thick and compacted to not less than 90% or 95% under pavements of the standard maximum dry density specified in AS 1289.5.4.1 or AS 1289.5.6.1, in such a way that the pipes are neither dislodged nor damaged.

The finished surface (top of trench fill) and the trench surround shall be restored, as near as practicable, to the level and condition of the existing surface before commencement of the excavation.

3.23 FOUL WATER TRENCH BACKFILLING - NZBC G13/AS2

Carry out foul water trench backfilling to/NZBC G13/AS2, 5.3 to 5.5 and fig 7.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.24 FOUL WATER TRENCH BACKFILLING - AS/NZS 3500.2

Carry out foul water trench backfilling to AS/NZS 3500.2, 5.1, 5.2 and 5.5 as modified by NZBC G13/AS3.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.25 SURFACE WATER TRENCH BACKFILLING - NZBC E1/AS1

Carry out surface water trench backfilling to NZBC E1, 3.9.6 and fig. 13.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.26 SURFACE WATER TRENCH BACKFILLING - AS/NZS 3500.3

Carry out surface water trench backfilling to AS/NZS 3500.3, 6.3.5.2.

PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

Subsoil ground water drainage

3.27 FILTER FABRIC TO DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Where details require drainage material to be encapsulated in filter fabric to prevent fines from blocking the aggregate. Place fabric and carefully hold in place by pinning and/or by controlled use of aggregate as ballast. After drain installation and required backfilling, complete encapsulation with fabric. Ensure filter fabric is correctly placed, sufficiently overlapped and pinned and/or secured.

3.28 LAY PERFORATED PIPING - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. Lay in straight runs to discharge into surface water drainage system. The pipe must not excessively elongate during installation. Carry drainage material up and over the pipes without disturbing them. Extend the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.29 LAY PERFORATED PIPING TO BASEMENT WALLS - SUBSOIL DRAINAGE

Ensure any required waterproofing and protection sheets are in place before starting work.

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage material screeded to the required gradient. The pipe must not excessively elongate during installation. Lay in straight runs to 1:150 gradients with invert of the highest horizontal point 50 mm minimum below floor slab level, discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Fill with drainage material to full height of wall. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

3.30 LAY PERFORATED PIPING TO RETAINING WALLS - SUBSOIL DRAINAGE

Lay perforated groundwater drainage piping with filter sock, firmly on a bed of drainage metal comprising of filter material to the NZTA F2 specification. Pipe bedding not less than 75mm deep. Backfill not less than 300mm deep. The pipe must not excessively elongate during installation. Lay in straight runs to correct gradients , discharging into surface water drainage system. Carry drainage material up and over the pipes without disturbing them. Place granular fill in layers not exceeding 150 mm thick loose depth, to full height of wall, with an allowance for the thickness of the surface finish. Compact to provide support of not less than that of the adjacent material. Where geocomposite drain is used, the backfill shall follow the manufacturer's recommendations. Carry the high end of all lines up to the surface in capped, solid pipe to provide for flushing out.

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3.31 CLEAN OUT SUBSOIL DRAIN INSTALLATION

Clean and flush out the whole subsoil drain installation and remove silt and debris before handing over.

4 SELECTIONS

4.1 PVC-U PIPES

Brand/type:	Contractor to confirm

4.2 POLYETHYLENE PIPES

Brand/type:	Contractor to confirm

4.3 STRIP DRAIN

Location:	Refer to Architectural Plans
Brand/type:	Contractor to confirm
Size:	Contractor to confirm
Grate:	Contractor to confirm

4.4 PERFORATED DRAINAGE PIPING - SUBSOIL DRAINAGE

Pipe brand/type:	Contractor to confirm - Novaflow
Diameter:	110mm
Sock brand/type:	Contractor to confirm

4.5 DRAINAGE MATERIAL - SUBSOIL DRAINAGE

Location:	Refer to Architectural Plans
Type:	Contractor to confirm

4.6 FILTER FABRIC

Brand:	Contractor to confirm
Type:	Contractor to confirm

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7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 RELATED WORK

Refer to Architectural Plans

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
COC	Certificate of Compliance
ELV	Extra Low Voltage
IP	international (ingress) protection classification
MCB	Miniature circuit breakers
NUO	Network Utility Operator
PCB	printed circuit board
RCCB	Residual Current-operated Circuit Breaker
RCD	Residual Current Device
SIA	security integration architecture
TCF	Telecommunications Carriers' Forum

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation of buildings
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 2648.1	Underground marking tape - Non-detectable tape
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3111	Approval and test specification - Miniature overcurrent circuit-breakers

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AS/NZS 3112:2017	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
NZS 3604	Timber framed buildings
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60898	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Series
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61008.1	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - Part 1: General rules
IEC 61009.1	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
IEC 61643	Components for low voltage surge protection devices
IEC 62423	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
IEC 62606	General requirements for arc fault detection devices

Electricity (Safety) Regulations 2010
NZ Telecommunications Forum (TCF) Premises Wiring Guidelines
Private Security Personnel Investigations Act 2010

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Contractor to supply

Manufacturer/supplier contact details:

Company:	Contractor to confirm
Web:	Contractor to supply
Email:	Contractor to supply
Telephone:	Contractor to supply

Warranties

1.5 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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

Requirements

1.6 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Guidelines for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

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1.7 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Electrical workers holding a current Practising Licence (with an appropriate Registration class) to carry out prescribed electrical work. An Electrical Worker who holds a Trainee Limited Certificate or a Limited Certificate to be supervised by a licensed electrical worker with an appropriate Registration class.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 QUALIFICATIONS WORKERS - LICENSED UNDER STATUTE - SECURITY TECHNICIAN

Security technician holding a licence under the Private Security Personnel and Private Investigators Act 2010. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.9 NO SUBSTITUTIONS

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

1.10 CONFIRM SELECTIONS

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

Requirements - Compliance

1.11 ELECTRICAL CERTIFICATE OF COMPLIANCE

At the completion of electrical work provide a Certificate of Compliance (CoC) to Electricity (Safety) Regulations 2010, regulation 65-67. Provide a copy to the Contract Administrator and NUO prior to connection and when required to the BCA for Code Compliance.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high risk electrical work as required by Electricity (Safety) Regulations 2010, regulation 70 High-risk prescribed electrical work to be inspected.

1.12 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the Contract Administrator and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

1.13 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Other information required by the BCA in the Building Consent Approval documents

1.14 INSPECTIONS

As required by QLDC

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2 PRODUCTS

2.1 MAINS SUPPLY

Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.4 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 61439.3, and installed in accordance with AS/NZS 3000, 2.10 Switchboards. Complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.5 EARTH ELECTRODE

To AS/NZS 3000, 5.3.6 Earth electrodes and Table 5.2 Acceptable Earth Electrodes. Installed as a vertical-type electrode to a minimum depth of 1.8m or a strip-type electrode buried in horizontal trench with not less than 0.5m cover and minimum horizontal length of 7.5m.

2.6 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A to AS/NZS 3000, 2.3.3 Main Switches and additional isolating switches to AS/NZS 3000, 2.3.4 Additional isolating switches.

Residual current protection, maximum sensitivity of 30mA, to AS/NZS 3000, 2.6 Additional Protection by Residual Current Devices, as modified by Electricity (Safety) Regulations 2010. RCD and RCCBs' to meet Type A to IEC 61009.1 / IEC 61008.1 or Type F or Type B RCD to IEC 62423.

Miniature Circuit Breakers (MCB) to AS/NZS 60898 series or AS/NZS 3111, 4.5kA domestic or 6kA for commercial.

2.7 SURGE PROTECTION

Provide surge protection device(s) to AS/NZS 3000, Appendix F Surge Protection Devices. Protection for the home's appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.

2.8 WALL BOXES

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Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.9 SWITCH UNITS

Single pole switches to be 10 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units.
Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.10 SWITCHED SOCKET UNITS

To AS/NZS 3000, 4.4 Socket-Outlets, 10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters to AS/NZS 3112 clause 3.12 as modified by Electricity (Safety) Regulation, single or multi gang as detailed. Refer to SELECTIONS.

2.11 HOT WATER SYSTEM ISOLATION SWITCH

To AS/NZS 3000, 4.8.2 Water heaters, one way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.12 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.13 LIGHT FITTINGS

To AS/NZS 3000, 4.5 Lighting Equipment and Accessories and if required, complete with lamps and, if required, transformer and control gear for dimming. Refer to SELECTIONS.

2.14 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

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

Refer to SELECTIONS.

2.15 SPACE HEATERS

Fixed wired room heaters radiant or convector, and compliant with Electrical (Safety) Regulations 2010, Schedule 4, 1 Household & similar appliances. Flush or surface mount, fitted with safety cut-outs. Refer to SELECTIONS

2.16 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to NZBC G4/AS1, and compliant with Electrical (Safety) Regulations 2010, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.17 HEATED TOWEL RAILS

Fixed wired heated towel warmers, IPX4 splash-proof, compliant with Electrical (Safety) Regulations, Schedule 4, 1 Household & similar appliances. Refer to SELECTIONS.

2.18 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Exterior grade, weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on. Refer to SELECTIONS.

2.19 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance.

Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

Refer to SELECTIONS.

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Fire / Acoustic rated accessories

2.20 FIRE RATED / ACOUSTIC SEALERS AND LINERS

Sealants, collars, wraps, expanding foam, mortars and liners, used to seal around pipe, conduit and sleeve penetrations through fire and acoustic walls and floors. Refer to SELECTIONS.

2.21 WALL BOXES AND SWITCH UNITS - FIRE RATED

Proprietary intumescent pad for plastic electrical sockets installed in plasterboard lined fire rated partitions providing an acoustic barrier and fire protection. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install electrical wiring and systems in accordance with Electricity (Safety) Regulations 2010, AS/NZS 3000 and other cited standards.

3.6 MAIN SUPPLY

Lay underground mains to the NUO and AS/NZS 3000, 3.11 Underground Wiring Systems requirements. Excavate trench, ensure minimum depth of cover to AS/NZS 3000 Table 3.6 Under-Ground Wiring Systems - Minimum Depth of Cover, install cable and marker tape complying with AS/NZS 2648.1 and backfill. If required, provide permanent cable marker signs to indicate the point where a cable enters or leaves a structure.

3.7 METER BOX

Fit to meter box manufacturer and Electricity Retailer requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1, Figure 9.1.8.3B: General meterbox and similar penetrations. Arrange for meter installation and connection.

3.8 DISTRIBUTION BOARD

Fit to AS/NZS 3000, 2.10 Switchboards and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.9 CIRCUIT BREAKERS

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.10 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.

If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached electrical units or equipment

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3.11 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.

If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

3.12 MAIN EARTH

Install main earthing conductor to AS/NZS 3000, 5.5.1 Main Earthing conductor. Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.13 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A. Install to AS/NZS 3000, Appendix O, Installation of Arc Fault Detection Devices (AFDD'S)

3.14 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000, Appendix F, F1.2.2 Installation.

3.15 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets (except for fixed or stationary cooking equipment), lighting & directly connected handheld electrical equipment, to AS/NZS 3000, 2.6.3.3.1 Residential installations - New Zealand only.

3.16 SET-OUT - OUTLETS & EQUIPMENT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.17 CABLING

Install wiring systems to AS/NZS 3000, Section 3 Selection and Installation of Wiring Systems. All cabling run concealed fix in position by suitable clips, saddles or clamps. Where possible, run cabling horizontally / vertically in straight line.

Locate holes in timber framing for the passage of cables at the centre line of member ensuring structural strength in maintained to NZS 3604 requirements. In steel studs/ structural steel, ensure aperture is brushed and shaped to minimize abrasion of cable. Cables may be supported by suspended ceiling systems unless not permitted by suspended ceiling manufacturer. Install cable in conduits where required to pass through concrete or underground.

3.18 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

3.19 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

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3.20 SWITCHES AND SWITCHED SOCKET UNITS

Fit all switch units and socket units to the manufacturers requirements with heights and mounting directions as indicated in SELECTIONS.

3.21 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the Contract Administrator, when not specifically shown on the drawings.

3.22 LIGHT FITTINGS

Install light fittings in locations and at heights as confirmed by the Contract Administrator, when not specifically shown on the drawings. Install to the luminaire manufacturer's requirements (including clearances) and to AS/NZS 3000, 4.5 Lighting Equipment & Accessories, in correct orientation for light output, complete with lamps.

Fix through linings to structure or framing, provide additional nogs, trim and packing if required. Ensure transformers/drivers and luminaires are adequately ventilated and clear of any building elements, to AS/NZS 3000.

3.23 EXTRA LOW VOLTAGE LIGHTING

Install extra-low voltage lighting to AS/NZS 3000, 7.5 Extra-Low Voltage Electrical Installations and fitting manufacturer's requirements.

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.24 INSULATION CLEARANCES

Refer to relevant INSULATION section.

3.25 EMERGENCY LIGHTING

Emergency escape lighting and exit signs for buildings to AS 2293.1 and NZBC F6/AS1. Fit emergency light fittings to manufacturer specifications. Refer to plans for position of fittings.

3.26 ELECTRIC HOT WATER SYSTEM

Install to manufacturer's requirements and to AS/NZS 3000, 4.8.2 Water heaters. Wire as a separate circuit through a wall-mounted, lockable, isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.27 SPACE HEATERS

Install to the heater manufacturer requirements, and to AS/NZS 3000, 4.9 Room Heaters. Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance or otherwise connect to a control switch located adjacent to the heater and a remote thermostat. Isolation switch shall be provided adjacent to entrance of room or area the heating system is located or installed in switchboard.

3.28 OUTDOOR/EXTERIOR SERVICES

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems, in accordance with AS/NZS 3000 and the fixture/fitting manufacturer's recommendations.

Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services to AS/NZS 3000, 3.11 Underground Wiring Systems.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56 minimum. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet.

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3.29 LABELLING

To AS/NZS 3000, 2.10.5 Equipment identification, include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Fire rated applications

3.30 SEAL ALL PENETRATIONS

Seal all penetrations, including in and around conduits and sleeves, in accordance with manufacturer instructions. For fire and/or acoustic rated elements, maintain the rating with the seal systems.

3.31 PROVIDE CABLE SLEEVES

Provide PVC sleeves formed from pipe sections, unless fire and/or acoustic systems require sleeves for other building elements and/or different material for the sleeve.

3.32 INSTALL WALL BOXES AND SWITCH UNITS - FIRE RATED

Install proprietary fire rated wall boxes and switch units in accordance with manufacturer instructions.

Completion & Commissioning

3.33 COMPLETION MATTERS

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

4 SELECTIONS

Materials

4.1 METER BOX

Location:	Refer to Architectural Plans, Electrical Plan
Brand / type:	Contractor to confirm

4.2 DISTRIBUTION BOARD

Location:	Refer to Architectural Plans, Electrical Plan
Brand / type:	Contractor to confirm

Outlets - fittings

4.3 EXTERIOR / INTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Refer to Electrical / Lighting Plans

4.4 EXTERIOR / INTERIOR LIGHT FITTINGS

Refer to Electrical / Lighting Plans

4.5 SMOKE ALARMS

Location:	Refer to Architectural Plans, Electrical Plan
Brand / type:	Contractor to confirm

4.6 SPACE HEATERS

Location:	Refer to Architectural Plans, Electrical Plan
Brand / type:	Contractor to confirm

4.7 ELECTRICAL APPLIANCES

Item	**Brand / type**
Range:	Contractor to confirm
Wall oven:	Contractor to confirm
Cooker top/hob:	Contractor to confirm
Range hood:	Contractor to confirm

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