The Granery

Project Specification

30-32 McCormick Street, Wānaka, New Zealand
Project Ref: 26005
Date: 17 September 2026



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

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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

Proposed new warehouse/storage units with 2x offices on street front.

Design Construction Safety

1.3 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

1.4 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site

1.5 LEGAL DESCRIPTION

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

Site environment - Durability

1.6 EXPOSURE ZONE

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

The site zone is: Zone B

Site environment - Wind

1.7 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

Building wind zone High

Site environment - Seismic

1.8 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 2

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Archaeological discovery

1.9 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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1232S1 EXPLANATION OF SCHEDULE SECTIONS

1 GENERAL

This general section provides an explanation of schedule sections and their relationship to general sections and work sections. Specific schedule sections contained within this specification are also identified.

1.1 EXPLANATION OF SCHEDULE SECTIONS

A schedule section identifies work sections that contain common requirements, as identified in the title of the schedule section. For example 1235S1 SCHEDULE OF SHOP DRAWINGS identifies work sections that have requirements for shop drawings. Details of the requirements are contained in the identified work sections with additional requirements contained in the general section 1235 SHOP DRAWINGS.

Some schedule sections are identified by the 4 digit CBI (Co-ordinated Building Information) number of the general section that they relate to, followed by the letter "S" followed by a numeral (1-9). The numeral allows for multiple schedule sections to be associated with the same general section.

Other schedule sections that do not share a common CBI number with a general section, have their own unique 4 digit CBI number, followed by the letter "S" followed by a numeral. These schedule sections contain additional subject content relating to the schedules and the identified work sections.

1.2 SCHEDULE SECTIONS

The following Schedule sections are contained within the specification:

1237S1 Schedule of Warranties
1239S1 Schedule of Operation & Maintenance Info



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1237 WARRANTIES

1 GENERAL

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

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

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

1.1 SCHEDULE SECTION

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

Warranties

1.2 PROVIDE WARRANTIES

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

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

1.3 WARRANTIES - INSTALLER/APPLICATOR

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

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

1.4 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

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Submission

1.5 REVIEW BY CONTRACTOR

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

1.6 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

Obtain copies of warranties required as a condition of the building consent in the form required for submission to the BCA. Keep safe and secure until required at the time of the BCA final inspection and Code Compliance Certificate.

1.7 WARRANTIES - REQUIRED BY CONTRACT

Obtain copies of warranties listed in the contract documents. Provide all warranties at the same time. If the project has an operations and maintenance documentation provision, present the warranties with the operations and maintenance information. If no operations and maintenance documentation provision exists, present the warranties to the contract administrator in a loose-leaf binder with a contents index suitably labelled and including the project name and details. Provide a title on the binder edge "Warranties for (project name)"

1.8 WARRANTIES - SUBMISSION NZS 3910 CONTRACT

Refer to NZS 3910 Conditions of Contract for building and civil engineering construction, for requirements relating to the time for submission of warranties and guarantees. Submit all warranties/guarantees to the Contract Administrator no later than the date that the contractor notifies that it believes the contract works qualify for practical completion or any other time stated in the Specific Conditions of Contract.

2 SELECTIONS

Project warranties / guarantees

Weathertightness and watertightness warranty

2.1 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

A warranty is required from the contractor for a minimum period of 2 years, covering the weathertightness of the complete building envelope and the watertightness of all liquid supply and disposal systems and fittings. This general warranty is in addition to any specific warranties required.

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

- Conform to the standard form WARRANTY AGREEMENT included in the contract documents.
- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

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1237S1 SCHEDULE OF WARRANTIES

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for warranties.

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1237 WARRANTIES
- Identified Work Sections

Warranties

1.2 WARRANTIES

Refer to the following sections:

4161T	Kingspan Thermakraft Underlays, Foils, DPC, DPM, & Tapes
4231HA	James Hardie Axon™ Panel Cladding
4251PI	Paneltec Indurabond FR Aluminium Cladding
4257CR	Conqueror CQ1000RWP Roof & Wall Trapezoidal Panels
4422VE	Viking Enviroclad Membrane
4521AR	APL Residential Aluminium Windows & Doors
4711P	Pink® Batts® Thermal Insulation
5311TR	T&R Interior Systems - Ceilings
6700	Painting General
7123	Hot & Cold Water System
7451AL	Allproof Level Threshold Drainage Systems

1.3 PROJECT WARRANTIES

Refer to section 1237 WARRANTIES for project warranties.

1.4 WARRANTIES - ADDITIONAL ITEMS

Refer to separate documentation for warranties not contained within this specification.



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1238 AS BUILT DOCUMENTATION

1 GENERAL

This general section relates to common requirements for the preparation, submission and review of as built documentation referred to within this specification and referred to within separate specifications/documents relating to this project. Detailed requirements for as built documentation for particular parts of the work may be included in specific work sections.

1.1 SCHEDULE SECTION

Refer to 1238S1 SCHEDULE OF AS BUILT DOCUMENTATION for work sections contained in this specification that have requirements for as built documentation.

1.2 AS BUILT DOCUMENT REQUIREMENTS

Where requirements for the as built documents and records are not stated in a specific section, they shall include:

As built drawings recording:

- The actual positions as constructed of all sewer, stormwater, sanitary plumbing, piped and ducted services, electrical and mechanical services.
- Inverts and locations of services at key points within the building and at the property lines.
- Dimension services in relation to the structure and building grid lines.
- Ductwork, piping, conduit and equipment, including such items provided for future use.
- Depth of various elements of foundations in relationship to the ground floor level
- Field changes of dimensions
- Other significant deviations and changes which are concealed in construction and cannot be identified by visual inspection
- Access doors and panels

Records of:

- Products and materials selected for alternatives specified
- Approved substitutions and accepted alternatives
- Other approved changes and deviations to items specified.

1.3 PROVISIONAL AS BUILT DOCUMENTS

Prior to practical completion provide provisional/draft as built documents in sufficient detail to allow the principal to operate, maintain, adjust and re-assemble the contract works and to allow for review by the reviewer. Where no named reviewer has been nominated, submit the as built documentation to the contract administrator. Submit in hard copy and electronic form.

1.4 AS BUILT DOCUMENT REVIEW

As built document review indicates only that the reviewer is satisfied that the documents are legible. The review is not a check of the accuracy or completeness of the documents, however the reviewer may comment on any aspect of the documentation and require the documents to be revised and resubmitted. Review of as built documents does not relieve the contractor of responsibility for their correctness.

Where no time is stated in a specific section, allow 10 working days for review by the reviewer. Where a large amount of documentation is involved more time will be necessary.

1.5 COMPLETE AS BUILT DOCUMENTS

Prior to the end of the defects notification/liability period, provide complete as built documents reflecting any review requirements, with all Information of good quality and properly titled, numbered, cross-referenced and dated. Provide documents in sufficient detail to allow the principal to operate, maintain, adjust and re-assemble the contract works. Submit in hard copy and electronic form to the contract administrator.

1.6 AS BUILT DOCUMENTS - ELECTRONIC COPY

Provide an electronic copy of the as built documents in the following format:

Drawings:	PDF format (in addition provide DWG files if available)
Other documents:	PDF format

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1239 OPERATION & MAINTENANCE

1 GENERAL

This general section relates to operation and maintenance (O&M) documentation referred to within this specification and referred to within separate specifications/documents relating to this project. This documentation is required by the principal so that they can operate and maintain the contract works.

1.1 SCHEDULE SECTION

Refer to 1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO for work sections contained in this specification that have requirements for:

- Information for operation and maintenance
- Operation and maintenance manuals
- Maintenance contract proposals

Operation and maintenance documents

1.2 OPERATION AND MAINTENANCE INFORMATION

Provide operation and maintenance documentation necessary to operate and maintain the works. This documentation is to include:

- Contractors name and contact details.
- A complete list of subcontractors' names, addresses and telephone numbers noting which portions of the contract each provided.
- A complete list of equipment and appliances including serial numbers, manufacturers' names and sources of supply.
- Copies of all manufacturers' and suppliers' product literature containing maintenance requirements/instructions, for any products in the building work.
- Information for operation and maintenance as required by work sections.
- Operation and maintenance manuals as required by work sections.
- Maintenance contract proposals as required by work sections.
- Final as built documents.
- Originals of all warranties and guarantees properly executed.
- Other information listed or referred to in this general section.
- Operation and maintenance information required by other project documents.

1.3 MAINTENANCE REQUIREMENTS

Provide details of any maintenance requirements required by the Building Act. In addition provide maintenance requirements for items including:

- Details of suggested building washing programme.
- Details of suggested re-painting programme.
- Location of flushing points for sub soil drainage systems.
- Location of surface water filter systems requiring regular cleaning.
- Overflow relief gully location and means of keeping charged.

1.4 EQUIPMENT AND APPLIANCE MANUALS AND OPERATING INSTRUCTIONS

Provide equipment and appliance manuals and operating information including details of all isolating valves and switches.

1.5 SELECTIONS INFORMATION

Provide details of actual selections used in the construction of the works including:

- Tapware type and supplier details.
- Sanitary ware including accessories type and supplier details.
- Light fitting type and supplier details.
- Door hardware type and supplier details.
- Carpet type and colour including underlay and the supplier details.
- Vinyl flooring type and colour including supplier details.
- Overlay timber floor type and supplier details.
- Tile type and supplier details.
- Fire supplier details.
- Aluminium joinery system and finish.
- Paint type and colours used.

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Include brochures and other information included with the items supplied.

1.6 SELECTIONS INFORMATION - SUBSTITUTIONS

Provide details of any selections used in the construction of the works that are different from what was specified.

Documentation format

1.7 O&M DOCUMENTATION FORMAT

Unless otherwise specified in a work section,

- Provide O&M drawings at scales appropriate to the detail to enable good legibility.
- Provide manufacturers documentation at the original scale.
- Provide written text generally in A4 format using a font not less than 10 point.

Submit O&M documentation in both hard copy and as electronic portable document format (PDF) files.

Submission and review

1.8 O&M DOCUMENTATION SUBMISSION & REVIEW

Unless otherwise specified in a work section, provide draft O&M documentation no later than the date of practical completion or the date on which the principal takes occupation of the works, whichever occurs first.

Submit O&M documentation to the named reviewer for review.

- Where no time is stated in a specific section, allow 10 working days for review by the reviewer. Where a large amount of documentation is involved more time will be necessary.
- Where no person is named in a specific section as the reviewer, submit the O&M documents to the contract administrator.
- Submit a proposed index system (as required for final documentation) to the contract administrator for review.

O&M review indicates only that the reviewer is satisfied that the documents are legible. The review is not a check of the accuracy of the documents, however the reviewer may comment on any aspect of the documentation and require the documents to be revised and resubmitted. Review of operation and maintenance documentation does not relieve the contractor of responsibility for the correctness of the documentation.

The reviewer may advise that:

- The O&M documentation has been reviewed and has been accepted without the need for further modification. The information can be included in the final documentation; or
- The O&M documentation has been reviewed and the information can be included in the final documentation subject to revision required by notes, annotations or comments provided; or
- The O&M documentation has been reviewed and is not acceptable, refer to notes, annotations or comments provided. Resubmit corrected/altered documentation for review.

Amalgamate the reviewed accepted and corrected O&M documentation into the final O&M documentation

Final documentation

1.9 SUBMISSION OF FINAL DOCUMENTATION

Prior to the end of the defects notification/liability period, provide complete O&M documentation in both hardcopy and electronic form.

1.10 FINAL O&M DOCUMENTATION - HARDCOPY

Provide the hard copy version of the O&M documentation in a loose-leaf binder with a contents index identifying operation and maintenance documents, requirements, manuals, operating instructions and selections. In addition include the project name, contractor's name and the date of practical completion on the index page.



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Include indexed sections to identify all operation and maintenance manuals that are not contained within the binder. Provide a copy of the front cover or other identifying feature of the manual within the section with a note stating "this manual has been provided separately".

Provide a title on the binder edge "Operation and maintenance instructions for (project name)". If more than one binder is required identify each binder by number and ranking (e.g. Volume 2 of 3) and group information logically between the binders for ease of reference.

Provide operation and maintenance manuals clearly and neatly marked on the spine or front cover so as to identify the project name. Where operation and maintenance manuals are a collection of loose leaf documentation, provide documentation in a loose-leaf binder as described above.

1.11 FINAL O&M INFORMATION - ELECTRONIC COPY

Provide a copy of all hardcopy information in PDF format arranged in logical named folders. In addition provide DWG files of documentation if available.

1.12 REVIEW OF FINAL DOCUMENTATION

The contract administrator may review the final documentation and require alteration and resubmission.

2 SELECTIONS

O&M Documentation

2.1 FINAL DOCUMENTATION - INFORMATION FOR OPERATION AND MAINTENANCE

Provide a complete electronic copy to the contract administrator.

Provide two hardcopy sets of completed O&M documentation to the contract administrator. At least one set is to contain all available original documentation. The contractor is to retain a third hardcopy set for their records.

Provide any documentation (including required original documentation) as required to the relevant territorial authority.

2.2 FINAL DOCUMENTATION - OPERATION AND MAINTENANCE MANUALS

Provide a complete electronic copy to the contract administrator.

Provide two hardcopy sets of completed maintenance manuals to the contract administrator. At least one set is to contain all available original documentation. The contractor is to retain a third hardcopy set for their records.

Provide any documentation (including required original documentation) as required to the relevant territorial authority.

Maintenance contract proposals

2.3 MAINTENANCE CONTRACT PROPOSALS

Unless otherwise specified in a work section, provide maintenance contract proposals to the contract administrator no later than the date of Practical Completion. Provide in electronic and hardcopy form.



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1239S1 SCHEDULE OF OPERATION & MAINTENANCE INFO

1 GENERAL

This schedule section identifies work sections in the specification that have requirements for the submission of:

- Information for operation and maintenance
- Operation and maintenance manuals
- Maintenance contract proposals

1.1 ASSOCIATED SECTIONS

Read in conjunction with:

- 1232S1 EXPLANATION OF SCHEDULE SECTIONS
- 1239 OPERATION & MAINTENANCE
- Identified Work Sections

Information for operation and maintenance

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the following sections:

4231HA	James Hardie Axon™ Panel Cladding
4251PI	Paneltec Indurabond FR Aluminium Cladding
4257CR	Conqueror CQ1000RWP Roof & Wall Trapezoidal Panels
5311TR	T&R Interior Systems - Ceilings
5811	Signs & Displays
7123	Hot & Cold Water System
7411D	Dimond Rainwater Spouting Systems

Operation and maintenance manuals

1.3 OPERATION AND MAINTENANCE MANUALS

Refer to the following sections:

5811	Signs & Displays

Maintenance contract proposals

1.4 MAINTENANCE CONTRACT PROPOSALS

There are no work section requirements.

Additional Items

1.5 ADDITIONAL ITEMS

Refer to separate documentation for the submission of operation and maintenance requirements not contained within this specification.



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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

Site preparation

1.4 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).

1.5 GROUND CONDITIONS

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

Temporary construction

1.6 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.

1.7 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.

1.8 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

1.9 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

1.10 FIRST AID EQUIPMENT
Provide first aid equipment.

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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 NOTICE

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

1.4 NOTIFIABLE WORK

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

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Noise and nuisance

1.5 LIMIT CONSTRUCTION NOISE

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

1.6 ACCEPTABLE NOISE LEVELS

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

1.7 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.8 ROADWAY AND FOOTPATH

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

1.9 VEHICLE CROSSING

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

1.10 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.

1.11 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.

1.12 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.

1.13 SMOKE FREE REQUIREMENTS

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

1.14 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.

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Set-out and tolerances

1.15 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.

1.16 DATUM

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

1.17 SET-OUT

Set out the work to conform with the drawings.

1.18 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.

1.19 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.

1.20 USE OF SET-OUT INSTRUMENTS

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

1.21 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.

1.22 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

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Refer to work sections for tolerance requirements for finishes.

Execution

1.23 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.

1.24 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.

1.25 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.

1.26 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.

1.27 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.

1.28 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.29 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

1.30 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.

1.31 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.

1.32 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.



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1.33 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.

1.34 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

1.35 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.

1.36 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.

1.37 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.

1.38 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.39 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.

1.40 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.

1.41 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

1.42 NEW PRODUCTS

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

1.43 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.



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1.44 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.

1.45 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.

1.46 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.

1.47 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.

1.48 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.49 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

1.50 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.

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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.

1.51 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.

1.52 OTHER SAMPLE REQUIREMENTS

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

Prototypes

1.53 PROTOTYPES - TESTING

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

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

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

1.54 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.

1.55 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

1.56 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.



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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.

Cleaning during the works

1.57 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.

1.58 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

1.59 REMOVE PROTECTION

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

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

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

Refer to individual work sections for any special removal requirements.

Completion

1.60 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.61 LEAVE WORK

Leave work to the standard required for the following procedures.

1.62 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.

1.63 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.

1.64 COMPLETE ALL SERVICES

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

1.65 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.

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- 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.

1.66 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

1.67 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.68 MOVING PARTS

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

1.69 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.

1.70 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.

1.71 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

1.72 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.

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Defects period submissions

1.73 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

1.74 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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2241 EXCAVATION

1 GENERAL

This section relates to the excavating required for the building works, removing surface soils and the disposal of excavated material.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 4402	Methods of testing soils for civil engineering purposes
WorkSafe	Good Practice Guidelines - Excavation Safety

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

Requirements

1.2 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.

Performance

1.3 ACCESS FOR MACHINES

Determine working conditions and access for machines. Take into account the time of year, the nature of the ground and subsoil to be excavated, the ground water table and all matters influencing the carrying out of the work.

1.4 SAFE WORKING CONDITIONS

Provide safe working conditions and adequate support to excavations at all times to WorkSafe, Good Practice Guidelines - Excavation Safety. Cover holes and fence off trenches and banks.

1.5 FOUNDATION BEARING

Request written instructions if a natural bearing is:

- reached at a lesser depth or
- not reached at the depth shown on the drawings.

In made-up ground excavate down to a natural bearing. Remove unsuitable material that is exposed and replace with compacted backfill.

1.6 INSPECTION

Arrange for inspections and before placing any new work. If bearing becomes inadequate due to any cause then stop work and request further instructions.

1.7 SITE MEASUREMENT, OTHER FORMATIONS

If for any reason the excavations have to vary from the drawings, those affected to be solid measured and the quantity recorded and agreed to in writing as the excavation proceeds.

2 PRODUCTS

Materials

2.1 TOPSOIL

Weathered soil, with organic inclusions capable of supporting the growth of vegetation.

2.2 CUT MATERIAL

Consisting of sands, gravels, sedimentary materials, clays, scoria and similar deposits.



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2.3 ROCK

Defined as material encountered in excavations which because of its size or position can be removed only by breaking up by explosives or mechanical plant such as jack hammers or percussion drills.

2.4 UNCONTROLLED FILL

Variable fill material placed with little or no compaction control.

2.5 EXCAVATED FILL

Material from other formations in the excavation which may be selected and approved as suitable for filling and complying with NZS 4402 by having grading and moisture content properties that will allow compaction to 95% of maximum density.

3 EXECUTION

Conditions

3.1 REPORT

Report any survey pegs, bench marks, and the like on any features, leaving them undisturbed until approval is given for removal.

3.2 COMPLY

Comply with the requirements of WorkSafe, Good Practice Guidelines - Excavation Safety.

3.3 WORK BY OTHERS

Before taking over work done on the site by others check all levels and conditions and report any discrepancies affecting further work.

3.4 EXISTING SERVICES AND FOUNDATIONS

Locate underground services and foundations before work is started. Any information provided regarding the location of these services and foundations is given from available records but with no guarantee of accuracy as regards alignment or depth. Furthermore no guarantee is given or implied that the information provided covers all existing services and foundations. Make good at no extra cost damage to existing services to the satisfaction of the appropriate network utility operator. Protect existing roads, footpaths, gutters, crossings etc from damage during work.

3.5 KEEP FREE OF WATER

Keep excavations free from water and keep water from excavations clear of other construction work.

3.6 TERRITORIAL AUTHORITY REQUIREMENTS

Obtain from the territorial authority requirements for the method of discharging water from the site.

3.7 FORM SUMPS

Form sumps outside the line of foundations and deep enough to drain excavations. Pump from sumps without disturbing excavations or any material in place.

3.8 SILT CONTROL

Undertake silt control measures required by territorial authorities and network utility operators in relation to design, location and discharge into the drainage system.

Application

3.9 STRIP TOPSOIL

Strip topsoil carefully over the whole site and stockpile where directed on the site, on the prepared subgrade, for re-spreading at the completion of the contract.

3.10 STRIP TO SUBGRADE

Strip the soil over the whole site to form a subgrade generally, but at a minimum of 200mm below the original ground level. Leave the subgrade level, clear of all loose material and with no impediment for the excavation work.

3.11 DIVERT WATERWAYS

Temporarily divert as necessary all ditches, field drains and other waterways encountered during the excavations and reinstate to approval on completion.

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3.12 DIVERT DRAINS AND SERVICE LINES

Divert services, drains and field drains encountered in the excavations to new routes clear of the building and reconnect to the requirements of the network utility operator.

3.13 BREAK OUT

Break out and remove old foundations, floor slabs, drains, manholes and septic tanks, seal up connections and remove contaminated soil. Grub out roots in excess of 75mm diameter to a minimum of 500mm below the bottom level of footings or paving. Backfill with selected excavated material, well rammed in layers.

Take special care when working close to retained trees and shrubs.

3.14 EXCAVATION GENERALLY

Excavate for pads, strip foundations and tie beams to the profiles and levels shown on the drawings. Allow clearance for working space and formwork as necessary. Trim to required profiles, falls and levels. If pouring against natural ground excavate an extra 25mm that side to provide 75mm minimum cover to reinforcement horizontally. Bench surface of sloping ground to receive filling.

Use plant and equipment suitable for the purpose.

3.15 OVER EXCAVATION

Make good with well compacted backfill.

3.16 EXCAVATED BACKFILL

Stockpile selected excavated backfill on site where directed so that it does not impede continuing works until it is required.

Finishing

3.17 BATTERS, TEMPORARY PROTECTION

Protect batters with a change of level between crest and toe of more than 1.5 metres from weather erosion with a waterproof covering of either hessian and tar, or heavy duty black polythene sheet. Seal at joints and securely fix down at crest and toe. Maintain coverings in good condition until the ground is secured by permanent construction.

Completion

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 SURPLUS TOPSOIL

Remove unwanted stripped soil from the site continually as the work proceeds. Clean up continually any soil if dropped on footpaths or roads.

3.20 SURPLUS MATERIAL

Remove surplus excavated material from the site continually as the excavation proceeds. Clean up continually any excavated material dropped on footpaths or roads.

4 SELECTIONS



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3821 TIMBER FRAMING

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as part of a partitioning system.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:
SG Structural grade to NZS 3604, 1.3 **Definitions**

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 673	Cavity battens

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

1.3 DIMENSIONS

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

2 PRODUCTS

Materials

2.1 TIMBER FRAMING, TREATED

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

2.2 APPEARANCE TIMBERS

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

2.3 STRAPPING

Treated to NZBC B2/AS1, NZS 3602, table 1 and to NZS 3640, clause 6.3.1.

Species:	Radiata pine
Grade:	SG6
Size:	70mm x 45mm, 45mm x 45mm or 45mm x 19mm

2.4 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

To NZBC E2/AS1. H3.1 Radiata pine battens, 20mm thick, 45mm minimum 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.

2.5 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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Components

2.6 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.

2.7 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.

2.8 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.

2.9 THREADED RODS

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

2.10 TIMBER CONNECTORS AND FIXINGS

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

2.11 BRACING STRAPS

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

2.12 POWDER ACTUATED FASTENERS

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

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).

3 EXECUTION

Conditions

3.1 PROTECT TIMBER

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

3.2 EXECUTION

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

3.3 SEPARATION

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

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

3.4 FRAMING MOISTURE CONTENT

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

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

3.5 TOLERANCES

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

- Deviation in plan, up to 10 metres, 5mm
- Deviation in plan, over 10 metres, 10mm total

- Deviation from horizontal, up to 10 metres, 5mm
- Deviation from horizontal, over 10 metres, 10mm total

- Deviation from vertical position per 3 metres, 3mm

- Deviation from horizontal and vertical, within openings, 3mm.

Application

3.6 SET-OUT

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

3.7 SET TIMBERS

Set timbers true to required lines and levels with mitres, butt joints, laps and housings cut accurately to provide full and even contact over the whole of the bearing surface.

3.8 TIMBER CUTTING

Select and cut spanning members to minimise allowable defects and avoiding knots and short grain on edges in the middle third, and shakes, splits and checks at mid-span and close to ends.

3.9 TIMBER PLATES AND FURRING

Fix to steelwork with bolts and washers or approved proprietary fastenings at 1 metre maximum spacing and not less than 2 fixings to each member, or to engineering specific design.

3.10 HOLES AND NOTCHES

Limit holes and notches, checks and half-housing for the structure to those allowable in NZS 3604. Neatly form holes and notches for services without lessening the structural integrity of the member.

3.11 CUTTING

Cutting for straightening to comply with NZS 3604, 8.5.3, **Straightening studs**.

3.12 EXPOSED TIMBER CONNECTORS AND FIXINGS

Do not use steel timber connectors and fixings on any structural framing exposed to view unless detailed on the drawings.

3.13 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of WorkSafe and the Health and Safety at Work Act 2015. Powder-actuated fastening tool operators to have the appropriate current Certificate and/or Licence and tools to have the appropriate certificate of fitness if necessary.

3.14 ADDITIONAL FRAMING

Position and fix all necessary members for the fixing of all services, fittings, fixtures, edges of linings or claddings, and to provide lateral support to load carrying framing.

3.15 FORM NAILED JOINTS

Fully drive nails in all structural joints with the number and location for each particular joint, to the requirements of the nailing schedules of NZS 3604. Where splitting could occur, pre-drill to 80% of nail diameter.

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3.16 FORM BOLTED JOINTS

Drill for and set bolts to ensure full bearing and development of the joint strength, with tension to just set the washers into timber or to engineering specific design.

3.17 FIT CONNECTORS AND FIXINGS

Fit connectors and fixings to obtain full bearing over all contact surfaces and full development of the required loading capacity for that particular joint and in accordance with the manufacturer's requirements or to engineering specific design.

3.18 FIT BRACING

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

3.19 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.20 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.21 CLEAN UP

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

3.22 LEAVE

Leave work to the standard required by following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.2 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
Valley boards:	Radiata pine	Merch	H1.2
Sarking:	Radiata pine	Merch	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.3 INTERIOR WALL FRAMING - RADIATA PINE

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

4.4 CEILING FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Ceiling joists:	Radiata pine	SG8	H1.2
Timber ceiling battens:	Radiata pine	SG8	H1.2

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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 WATERGATE PLUS

Thermakraft Watergate Plus wall underlay meets the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ10002.

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 WATERGATE PLUS

Thermakraft Watergate Plus wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 695

1.10 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

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1.11 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.

Synthetic underlays - fire retardant

2.2 THERMAKRAFT WATERGATE PLUS

CodeMark certified and BRANZ appraised synthetic wall underlay, white with blue logo print, composed of a water resistant vapour permeable film laminated to a non-woven polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤5. Available in 685mm, 1370mm and 2740mm width. Refer to SELECTIONS.

Components - sealing

2.3 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.

2.4 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.

Fixings

2.5 FIXINGS - TO TIMBER

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

2.6 FIXINGS - TO STEEL

Construction grade double sided tape, adhesive or galvanized flat head screws to suit application. 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/application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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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 - wall underlay

3.6 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.

3.7 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.

Preparation of wall underlay for window/door placement

3.8 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.

3.9 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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.

3.14 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

3.15 COMPLETION MATTERS

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

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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

Manufacturer:	Thermakraft
Brand:	Supercourse 500
Type:	Damp proof course

Synthetic underlays - fire retardant

4.2 WALL UNDERLAY - THERMAKRAFT WATERGATE PLUS

Manufacturer:	Thermakraft
Brand:	Watergate Plus
Type:	Synthetic wall underlay
Maximum UV exposure:	90 days

Components for sealing wall underlay penetrations

4.3 PENETRATION SEAL - THERMAKRAFT ONESEAL

Manufacturer:	Thermakraft
Brand:	OneSeal
Type:	Pipe and service penetration seal
Maximum UV exposure:	120 days

4.4 75MM FLASHING TAPE - THERMAKRAFT THERMAFLASH

Manufacturer:	Thermakraft
Brand:	Thermaflash
Type:	Flashing tape
Width:	75mm
Maximum UV exposure:	180 days

4.5 150MM FLASHING TAPE - THERMAKRAFT THERMAFLASH

Manufacturer:	Thermakraft
Brand:	Thermaflash
Type:	Flashing tape
Width:	150mm
Maximum UV exposure:	180 days

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4231HA JAMES HARDIE AXON™ PANEL CLADDING

1 GENERAL

This section relates to the supply and fixing of James Hardie Axon™ Panel cladding.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:
LRV: Light Reflectance Value
CLD: Ceramic Low Density

Documents

1.2 DOCUMENTS

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

NZBC C/AS1	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
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products-Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 3837	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
NFPA 285:2019	Standard fire test method for evaluation of fire propagation characteristics of exterior wall assemblies containing combustible components

CodeMark Certificate CMNZ30165 - Axon™ Panel Cladding by James Hardie

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:

Axon™ Panel Timber Cavity Batten Technical Specification March 2024
Axon™ Panel Fixed to Hardie™ CLD™ Structural Cavity Batten Technical Specification March 2024
Axon™ Panel Direct Fixed Technical Specification March 2024
Hardie™ Flex Sheet technical specification
Fire and Acoustic Design Manual by James Hardie, May 2025
BRANZ Appraisal 1211 [2022] - Axon™ Panel Cladding
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:	Ask James Hardie™ on 0800 808 868.

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie Axon™ Panels (refer to James Hardie product warranty)

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15 year:	For accessories supplied by James Hardie (refer to James Hardie product warranty)
From:	Date of purchase

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

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

Performance - Wind

1.8 PERFORMANCE - WIND

James Hardie Axon™ Panel is suitable for use in all wind zones up to design wind pressure of 3.2kPa ULS and building height 25m maximum.

Performance - Fire

1.9 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 WALL UNDERLAY

Refer to section 4161 UNDERLAYS, FOIL AND DPC.

2.2 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 45mm wide and 70mm wide x 18mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.4 AXON™ PANEL

James Hardie Axon™ Panel, face primed shiplap jointed panels, 9.0mm and 8.5mm thick, manufactured from cellulose fibre reinforced cement to AS/NZS 2908.2. Refer to SELECTIONS.

Components

2.5 FASTENER TYPE

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

Refer to NZBC E2/AS1, Table 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.

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

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

Refer to SELECTIONS.

2.6 NAIL - AXON™ PANEL FIXING TO TIMBER CAVITY BATTEN

Over flexible wall underlay: 65mm x 2.8mm Hardie™Flex nails

Refer to SELECTIONS.

Accessories

2.7 FLASHING TAPES - TIMBER CAVITY BATTEN

Inseal® 3259 black compressible medium density closed cell foam tape, 1.5mm thick x 48mm wide for vertical joints, and 1.5mm thick x 80mm wide for internal corners.

2.8 ALUMINIUM ACCESSORIES

Extruded aluminium etch primed. External box corners and horizontal 'h' flashing suitable for dark paints.

2.9 SEALANT

Flexible sealant. Refer to the sealant manufacturer's technical literature to confirm suitability for the application.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.

3.2 HANDLING

Avoid distortion and contact with potentially damaging shiplap edges and surfaces. Do not drag panels across each other, or across other materials. Protect edges, corner and surface finish from damage.

3.3 SUBSTRATE

Do not commence work until the substrate is of the standard required 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 panels are fixed.

Confirm that 70mm minimum framing for vertical joints for timber cavity construction has been correctly installed.

3.4 SEAL EDGES

Seal site cut sheet edges prior to installation. Seal panel edges around window and door openings, meter boxes and at other penetrations.

Application - generally

3.5 FIX WALL UNDERLAY

Refer to 4161 UNDERLAYS, FOIL AND DPC.



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3.6 TIMBER CAVITY BATTENS

Install 18mm minimum thick cavity battens to NZBC E2/AS1, 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc).

Do not use continuous horizontal cavity battens at nogs or at bottom plate. Use cavity spacers where fixing is required between cavity battens.

3.7 PENETRATIONS AND FLASHINGS

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

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

Install Axon™ Panel cladding

3.8 PANEL LAYOUT

All panel edges must be supported by the framing. Fix Axon™ Panels vertically.

3.9 FASTENER - SIZE AND LAYOUT

Fix Axon™ Panels to framing using the fixings specified in James Hardie® Axon™ Panel technical specifications and in accordance with the following requirements:

- Nails must have a minimum clearance of 18mm from sheet edges and a minimum of 75mm vertically and 150mm horizontally from sheet corners.
- Nails must finish flush with sheet surface.

3.10 FIXING - TIMBER CAVITY CONSTRUCTION, FLEXIBLE UNDERLAY

Fix with 65mm x 2.8mm Hardie™ Flex nails when fixed over a flexible underlay. Fix sheet at 200mm centres at all studs.

3.11 GUN NAILING

Axon™ Panels can be fixed using nail guns. The gun nails used must have a full round head to provide the required holding power. The length and gauge of nails must at a minimum be as specified in the James Hardie Axon™ Panel technical specifications.

3.12 VERTICAL JOINT

Joint Axon™ Panels in accordance with James Hardie Axon™ Panel technical specifications.

3.13 HORIZONTAL JOINT

Provide a horizontal joint at floor joist levels to accommodate the movement resulting from timber joist shrinkage and settlement. Install a 'z' flashing where drainage is required at floor level.

For Axon™ Panels use a Hardie™ 9mm Panel aluminium 'h' mould complete with 'h' mould jointer, external corner jointer or a Hardie™ 9mm aluminium angled 't' mould complete with angled 't' mould jointer, external corner jointer or a purpose made 'z' flashing to form a horizontal joint.

3.14 FINISHING

Refer to painting section/s for protective coating system.

Completion

3.15 REPLACE

Replace all damaged or marked elements.



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3.16 LEAVE

Leave work to the standard required for following procedures.

3.17 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 TIMBER CAVITY BATTENS

Timber species:	Radiata pine
Treatment:	H3.1
Size:	45mm wide x 18mm thick minimum, height to match framing studs
Fastener type:	40mm x 2.8mm Hardie™ Flex nails
Fastener finish:	Hot-dipped galvanized
Fixing centres:	800mm

4.2 JAMES HARDIE AXON™ PANELS - SHEET CLADDING PANELS

Brand/type:	James Hardie Axon Panel Smooth
Thickness:	9mm
Fastener type:	65mm x 2.8mm Hardie™Flex
Fastener finish:	Hot-dipped galvanized

Finishing

4.3 PAINTING

Refer to painting section/s for details.



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4251PI PANELTEC INDURABOND FR ALUMINIUM CLADDING

1 GENERAL

This section relates to the design, fabrication, supply and installation of **Indurabond FR** Aluminium Composite Panels to building envelopes including walls, parapets, fascia and soffits, supplied by **Paneltec New Zealand Ltd**.

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:

WGANZ	Window & Glass Association NZ
NFPA	National Fire Protection Association
SLS	Serviceability limit state
ULS	Ultimate limit state
FR	Fire rated

The following definitions apply specifically to this section:

ULS	The state at which the strength or ductility capacity of the structure is exceeded or where it cannot maintain equilibrium and becomes unstable
SLS	The state at which a structure becomes unfit for its intended use, through deformation, vibratory response, degradation or other operational inadequacy
FR	Fire resistance rating (FRR) measured in minutes.

Documents

1.2 DOCUMENTS

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

AS/NZ 1530.1	Methods for fire tests on building materials, components and structures - Part 1: Combustibility test for materials.
AS 1530.4:2005	Methods for fire tests on building materials, components and structures - Part 4: Fire resistance test of elements of construction.
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 4284	Testing of Building Facades
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss 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)
NFPA 285:2019	Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components.
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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- PASS™ Product Assurance Supplier Statement 19092 - Indurabond FR Aluminium Composite Panels
- Indurabond FR Installation Manual
- Induraseal Facade Sealant Technical Data Sheet

Manufacturer/supplier contact details

Company:	**Paneltec NZ Ltd**
Web:	www.paneltec.co.nz
Email:	info@paneltec.co.nz
Telephone:	0508 726 358

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier coating and panel warranty:

15 years	For panels.

- Provide this warranty on the manufacturer/supplier standard form (if unavailable, 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.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	For installation of cladding system

- Provide this warranty on the installer/applicator standard form (if unavailable, 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 WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be an approved Paneltec installer, experienced in the installation of Paneltec Indurabond FR Aluminium Composite Panel and accessories. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

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.

1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified **Paneltec** systems, components or associated product listed in this section.

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:
Paneltec Maintenance Requirements

Provide this information prior to Practical Completion.

Compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's / supplier's warranty
- Installer's / applicator's warranty
- Producer Statement - Construction (PS3) from the applicator / installer

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- Producer Statement - Construction Review (PS4) from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

Performance - design

1.11 DESIGN REQUIREMENTS

Refer to SELECTIONS for requirements.

Performance - fire

1.12 C/AS2 EXTERNAL FIRE SPREAD - WALL CLADDING SYSTEM

The **Indurabond FR** cladding system has been tested to NFPA 285 **Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components** and AS/NZS 1530.1 **Methods for fire tests on building materials, components and structures - Part 1: Combustibility test for materials,** and passed.

Performance - Wind (design by contractor)

1.13 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, **Timber-framed buildings,** table 5.4.
Refer to general section 1220 PROJECT for details.

Performance - general

1.14 FIXINGS, EARTHQUAKE

Use fixings and methods capable of sustaining the loads appropriate to the area as required by NZS 1170.5, **Structural design actions - Earthquake actions - New Zealand.**

1.15 WEATHER-TIGHT PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. **Indurabond** has been tested to AS/NZS 4284, **Testing of Building Facades.**

2 PRODUCTS

Materials

2.1 WALL UNDERLAY

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

2.2 INDURABOND ALUMINIUM COMPOSITE PANEL

4mm fire rated mineral core sandwiched between two skins of 0.5mm thick 3003 H24 aluminium. External surface finished with PVDF KYNAR 500 fluoro polymer coating available in a range of colours. Internal surface finished with polyester anti-corrosion coating.

Components

2.3 FIXING SECTIONS

Indurafix 'Z' section extruded aluminium fixing brackets to **Paneltec** requirements.

2.4 FIXINGS AND FASTENINGS

Fixings and fasteners to **Paneltec** requirements.

2.5 STANDARD OPEN JOINT FLASHINGS

Standard open joint flashings to **Paneltec** requirements.

2.6 PACKERS / SHIMS

Plastic packers / shims to **Paneltec** requirements.

2.7 SCREWS

Stainless steel with pan head square drive heads finished to match surrounding surfaces where visible. Use concealed screws wherever practicable.

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2.8 RIVETS

Aluminium alloy blind rivets of the same composition as the materials being joined.

2.9 BOND BREAKER TAPE

Bond breaker tape to **Paneltec** requirements.

2.10 PEF BACKING RODS

Sabre Seal or MS Facade. Refer to SELECTIONS.

2.11 INDURASEAL FACADE SEALANT

Induraseal Facade Sealant weatherproof, professional grade, low modulus, single component silicone sealant. Sealant is UV stable, APEO-, formaldehyde- and phthalate- free and has ±50 % movement capability. Suitable for indoor and outdoor use. Comes in a 600ml foil pack. Available black, grey and white coloured.

2.12 COMPATIBILITY

All materials, components and accessories compatible on the electrochemical scale of metals so that no excessive sacrificial corrosion will occur.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to the general section 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/application

3.4 INSTALLATION

All work to be carried out in accordance with **Paneltec** stated requirements and the approved shop drawings.

3.5 TOLERANCES

Refer to the **Paneltec** literature for the permitted tolerances.

3.6 TOUCH-UP

In-situ touch-up of factory applied finishes is not permitted unless a trial repair is subsequently approved in writing. Replace all other panels with a damaged finish.

3.7 DO NOT USE

Do not use adhesive tape, film, papers, or sprayed protective coatings, or masking tape, which might become bonded after exposure to sun or weather. Remove any temporary protection after installation. Remove any protective coating residues immediately.

Assembly

3.8 FABRICATE

Fabricate aluminium composite panels and elements in the workshop wherever possible, ready for assembly and erection on the building site.

3.9 DO NOT ALTER

No cutting, trimming, welding or brazing of component parts during erection in any manner that would damage the finish, decrease the strength or result in visual imperfection or failure in performance to be executed during erection. Return any component parts that require alteration to the shop for correction or replacement with new parts.



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3.10 ANCHORAGE

Ensure anchorage of the cladding structure to the building structure is carried out in accordance with **Paneltec** approved methods and requirements.

3.11 COMPONENTS

Ensure all components are fixed level, true to line with uniform joints and reveals.
Ensure the maximum deviation for vertical and horizontal members is to manufacturer's specifications.
Ensure the maximum offset from true alignment between the abutting members is to manufacturer's specifications.
Ensure the tolerance of width of the joints between two panels is to manufacturer's specifications.

Installation - general

3.12 PENETRATIONS

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

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

3.13 INSTALL PANELS

Install aluminium composite panels in accordance with the stated design parameters (including design modules), reviewed shop drawings and installation details. Consult and co-ordinate as necessary with installers of adjoining and related work, including window and door installations.

N.B. Do not use more than one batch on each elevation. If this is unavoidable (i.e. more than one batch on one elevation) then batches to be digitally colour checked against each other by Paneltec.

3.14 INSTALL PANEL JOINTS

Install panel joints in accordance with **Paneltec** requirements.

3.15 FIX SOFFITS

Fix soffit panels in accordance with **Paneltec** requirements. Supply and fix all edge flashings and edgings as detailed.

3.16 SEAL PANELS

Clean panel joints with solvent ensuring adequate ventilation when applying. Mask adjoining surfaces to joints and install backing rods and bond breaker tape to manufacturer's requirements. Prepare caulking gun with Induraseal Facade Sealant. Carefully cut off the tip of the sealant sausage and slip into the caulking gun. Cut the nozzle into an appropriate diameter at an angle of approximately 45° to 60°, place the nozzle into the caulking gun and screw tight. Extrude the sealant with a single bead and apply to panel joint. Tool the sealant bead with a clean and dry tool within the working time for a smooth finishing and 2mm to 4mm negative to the panel face. Carefully remove masking tape from panel within the manufacturer's recommended time and after sealant is cured. Clean up panels by mechanically removing cured sealants. Remove wet sealants with acetone or mineral spirits.

3.17 COMPLETE

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

Completion & Commissioning

3.18 COMPLETION MATTERS

Refer to the general section 1270 CONSTRUCTION for completion requirements and, if required, commissioning requirements.

4 SELECTIONS

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



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

Materials

4.1 INDURABOND FR ALUMINIUM COMPOSITE PANELS

Location:	Feature canopy to Units 1 & 14 on street front.
Supplier:	Paneltec New Zealand Ltd.
Panel type:	Indurabond FR
Panel thickness:	4mm
Panel width:	1570mm
Fixing method:	Indurafix Z brackets
External surface finish:	PVDF KYNAR 500 coating
Colour:	Ironsand or Flaxpod
Reverse side finish:	Polyester anti-corrosion coating
Cavity width	50mm

Components

4.2 PEF BACKING RODS

Brand: Sabre Seal

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4257CR CONQUEROR CQ1000RWP ROOF & WALL TRAPEZOIDAL PANELS

1 GENERAL

This section relates to the supply and installation of Conqueror CQ1000RWP Roof & Wall Panel, a pre-painted steel clad insulated panel with trapezoidal profile to exterior face.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Association Inc
PIR	Polyisocyanurate
SS	Stainless steel

Documents

1.2 DOCUMENTS

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

BPS	Building Product Specifications
NZBC E2/AS1	External Moisture provisions for timber-framed buildings up to 10m in height
AS 1366.2	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polyisocyanurate (RC/PIR)
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 2122.1	Combustion characteristics of plastics - Determination of flame propagation - Surface ignition of vertically oriented specimens of cellular plastics
AS/NZS 2728	Prefinished / prepainted sheet metal products for interior/exterior building applications - Performance requirements
NZS 4214	Methods of determining the total thermal resistance of parts of buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 4859.2	Thermal insulation materials for buildings - Design
AS/NZS ISO 9001	Quality management systems - requirements
AS ISO 9705:2003	Fire tests - Full scale room test for surface products
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Heat release rate (cone calorimeter method) and smoke production rate (dynamic measurement)
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmospheres -Classification, determination and estimation
ISO 9705:1993	Fire tests - Full scale room test for surface products
FM Approval 4471	Class 1 Panel Roof
FM Approval 4880	Class 1 Fire rating of building panels or interior finish materials
FM Approval 4881	Class 1 Exterior wall systems
NZMRM COP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Conqueror CQ1000RWP Roof & Wall Panel, Technical Specification
Conqueror Standard Details - Conqueror CQ1000RWP Ambient Roof Panel
Colorsteel Maintenance Recommendations brochure
Various fire tests

Manufacturer/supplier contact details

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Company:	Kingspan Ltd
Trading as:	Conqueror
Web:	www.conqueror.co.nz
Email:	info@conqueror.co.nz
Telephone:	0800 799 923

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Conqueror CQ1000RWP for external & internal environments ISO 9223 C1, C2, C3 and corresponding categories to AS/NZS 2728 Categories A, B & C.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 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

1.6 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

All installation of the panels to be completed by an installer trained by Conqueror. Refer to 1270 CONSTRUCTION for additional 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 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:
Colorsteel Maintenance Recommendations brochure

Provide this information prior to practical completion.

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Other information required by the BCA in the Building Consent Approval documents.

Compliance information

1.10 COMPLIANCE - PROPOSED ALTERNATIVE SOLUTION

Conqueror CQ1000RWP Roof & Wall Trapezoidal Panel is presented as an alternative solution for:

NZBC Clause:	E2-External moisture
Performance:	E2.3.1 Roofs must shed precipitated moisture. E2.3.2 Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.



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Proposed alternative solution is supported by:

- In-service history
- Conqueror standard details
- Trapezoidal profile to NZBC E2/AS1, 8.4.3 Profile, requirements for Trapezoidal asymmetric profile with minimum crest height of 19mm and flat pan between crests of 210mm
- NZMRM COP - The NZ Metal Roof & Wall Cladding Code of Practice

Performance

1.11 INTERIOR SURFACE FIRE PROPERTIES - WALLS & CEILING, GROUP NUMBER

Conqueror CQ1000RWP has been tested to ISO 9705:1993 and AS ISO 9705:2003 and has been assigned the following Group Numbers to BPS, 8.5.1 Group Numbers:

Conqueror CQ1000RWP	Group Number 1-S

1.12 FIRE PROPERTIES FOR INSULATION - FLAME PROPAGATION

PIR Foam in Conqueror CQ1000RWP has been tested to AS 2122.1 and complies with flame propagation criteria of AS 1366.2 Table 2.

1.13 EXTERNAL FIRE SPREAD - CLADDING MATERIAL, CLASSIFICATION

Conqueror CQ1000RWP has been tested to ISO 5660.1 and to specific requirements of BPS, 8.4.1 Cladding materials, achieving:
Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

1.14 THERMAL PERFORMANCE - MATERIAL

Conqueror CQ1000RWP Roof & Wall Panel, material R-Value (aged thermal value at 15°C) has been tested and calculated to requirements of AS/NZS 4859.1 & 2. The installed R-value has been determined using NZS 4214. Refer to SELECTIONS for R-values.

2 PRODUCTS

Materials

2.1 CONQUEROR CQ1000RWP ROOF & WALL PANEL

Pre-painted, steel-faced, trapezoidal profile, insulated panels comprising a PIR foam core with G300S steel sheet bonded to both faces. Steel faces coated to AS 1397 and pre-finished to AS/NZS 2728. External trapezoidal face is 0.55mm BMT, Type AM 150 (aluminium zinc, magnesium alloy) Colorsteel Maxam and flat or ribbed internal face is 0.40mm / 0.55mm BMT, Z275 CP galvanized coating or 0.55mm BMT Maxam as per external face. The panels are designed and manufactured under approved quality control systems to AS/NZS ISO 9001. Conqueror CQ1000RWP Roof & Wall Panels are approved by FM to the following Approved standards (refer to FM listing):

- FM4880 – internal wall and ceiling panels without height restrictions (certified name: CQ1000RWP)
- FM4881 – Class 1 External Wall Panel System without height restriction (certified name: CQ1000RWP)
- FM4471 – Class 1 Roof panel systems (certified name: CQ1000RWP)

Refer to SELECTIONS.

Components

2.2 FIXINGS - PRIMARY FIXINGS

Carbon steel, minimum class 4 anti-corrosion coated, or stainless steel, self-drilling self-tapping fasteners with a minimum 19mm diameter washer face EPDM Sealed Washers or saddle washers. Colour matched to adjacent panel. Refer to SELECTIONS.

2.3 FIXINGS - STITCHING SCREWS

Carbon steel, minimum class 4 anti-corrosion coated, or stainless steel, self-drilling self-tapping fasteners with a minimum 15mm diameter EPDM sealed washer. Fastening head colour matched to adjacent panel. Refer to SELECTIONS.

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2.4 FIXINGS - FLASHINGS

Carbon steel, minimum class 4 anti-corrosion coated, self-drilling self-tapping fasteners or sealed rivets. Fastening head colour matched to adjacent panel. Refer to SELECTIONS.

2.5 FLASHINGS & TRIMS

Fabricated from 0.55mm thick steel to match adjacent panel facing coating & colour.

2.6 PIPE FLASHINGS

Proprietary flexible EPDM boot flashing. Refer to SELECTIONS.

Accessories

2.7 PROFILE FILLER

Conqueror RWP profile filler, closed cell polyurethane foam.

2.8 JUNCTION FOAM FILLER

Fire retardant, gun applied canister polyurethane insulation to fill cavities between panels. Refer to SELECTIONS.

2.9 TAPE SEALANT

Conqueror 6x4mm butyl tape sealant.

2.10 BUTYL SEALANT

Gun-grade butyl sealant. Refer to SELECTIONS.

2.11 SILICONE JOINT SEALANT

Neutral cured silicone sealant & PEF backing rod. 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.

Support structure is to be suitably plumb and level. Framing to be assembled to a tolerance between purlins or posts / girts / studs of L/600 between planes of adjacent bearing planes, or ± 5mm, whichever is smaller, where L is the distance between supports.

Support structure to provide a full bearing surface for the panel of 60mm for steel purlins / girts or 63mm for timber, refer to details for bearing face requirements at panel ends and end lap junctions as this may differ. Timber to be a minimum depth of 50mm to meet fastener requirements.

Moisture content at installation to be:

Timber substrate:	18% maximum moisture content (unless isolated from panel internal face)

3.4 DO NOT USE

Do not use adhesive tape, film, papers, or sprayed protective coatings, or masking tape, which might become bonded after exposure to sun or weather.

3.5 REMOVE PROTECTIVE FILM

Where panels are supplied with plastic protective film, this is to be removed prior to installation and within 4 weeks after delivery. Remove any protective coating residues immediately.

3.6 REPAIR OF FACTORY APPLIED FINISHES

In-situ touch up of factory applied finishes is not permitted unless agreed to writing by Contract Administrator.

3.7 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity by fitting a non-bituminous separation barrier or DPC between, including between Conqueror panels and cement based materials.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 FABRICATE

Fabricate panels and cut to length to order, ready for erection on the building site. Where required, provide end panel, factory cut back to project requirements. Remove PIR core and internal lining to factory cut back on site.

3.10 INSTALLATION GENERALLY

Install Conqueror CQ1000RWP in accordance with consented drawings, Conqueror requirements and NZMRM COP to form a weather-tight performance for the completed system, including all junctions, flashing/capping and penetrations.

Coordinate with installers of adjoining work, including door & window installations.

3.11 INSTALLATION SEQUENCE

Confirm panel lay direction with construction programme prior to ordering.

Where practical, for roof and vertical wall applications, lay panels so side lap joints are positioned away from the prevailing wind direction.

For horizontal wall application commence laying from the base of the wall.

3.12 CUTTING OF PANELS

Complete all cutting using a circular saw with a fine-toothed metal cutting blade. Do not use abrasive discs. When practicable, cut panels on ground prior to installation. Clean swarf from the panel immediately.

3.13 PANEL FIXING - ROOF

Fix to structure with primary fixings through every crown of the profile at panel end and mid-span. Valley fix at ridge cap, apron flashing and other flashing locations. Use correct socket and drive, including depth-locating nose piece to prevent over-driving. Refer to details.

3.14 EXTERNAL LAP JOINTS

Fix external side lap joints at 450mm centres maximum with stitching screws. Apply a continuous run of 6x4mm butyl sealant tape to the weatherside. Seal side laps with gun grade butyl sealant.

3.15 STOP ENDS - ROOF

Form stop-ends at the upper end of roofing panels and infill ridge gap with junction foam filler.

3.16 FILL GAPS

Fill gaps with PIR foam blocks, mineral fibre and junction foam filler in accordance with details.

3.17 FLASHINGS

Install flashings with 150mm sealed overlap, if required, in accordance to details. Flashings to be fixed at 450mm centres maximum with stitching screws.

Weather seal all external flashings and air seal all internal flashings to standard Conqueror details with 6mm x 4mm butyl rubber sealant tape.

Where flashing is fixed across the crowns install profile foam filler, sealed top and bottom with gun grade butyl sealant.

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3.18 PENETRATIONS

Form penetrations to Conqueror standard details. Cut openings for outlets, vents, flues and other penetrations to minimum size necessary. Co-ordinate structural support of panel for any penetration over 300mm diameter. Penetrations with upstands to be framed out if loads are being applied.

Fit pipes with a flexible EPDM boot flashing to manufacturer's requirements, other penetrations to be flashed as detailed to provide a weathertight installation. Isolate electrical cable penetrations from the steel skin and core.

3.19 FLUSH JOINT TO ADJACENT SURFACES

Form construction joint to adjacent surfaces as detailed. Seal with silicone sealant over PEF backing rod.

3.20 CLEAN

Remove all drilling swarf, rivet mandrels and any other metallic debris from panel surface daily, using a soft bristle broom and/or hosing down with clean water. Clean panel surfaces with soft, clean cloths and clean water and in accordance with the Colorsteel's stated requirements. Do not use abrasive or alkaline materials.

Completion & Commissioning

3.21 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 CONQUEROR CQ1000RWP ROOF PANELS

Roof pitch:	4
Panel type:	CQ1000RWP
Panel thickness:	core thickness 100mm
Material R-value:	4.55
Installed R-value:	4.67
External finish:	0.55mm thick AM150 Maxam colour coated steel
External profile:	Trapezoidal
External colour:	Ironsand
Internal finish:	0.4mm thick, Z275 CP G300S coated steel
Internal profile:	Flat
Internal colour:	Titania

4.2 EXTERNAL FLASHINGS

Thickness/material:	0.55mm / Colorsteel Maxam colour coated steel
Colour:	To match exterior panel face colour

4.3 INTERNAL FLASHINGS

Thickness/material:	0.55mm / Steel
Colour:	To match interior panel face colour

Accessories

4.4 PROFILE FILLER

Type:	Conqueror RWP profile filler

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4422VE VIKING ENVIROCLAD MEMBRANE

1 GENERAL

This section relates to **Viking Enviroclad** membrane, suitable for industrial, commercial and residential roofing and decking applications.

It includes:

- **Enviroclad** applied as a single layer membrane
- all required components and accessories to complete installation

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

TPO	Thermoplastic polyolefin

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 1604.1	Preservative-treated wood-based products - Part 1: Products and treatment
AS/NZS 1859.1	Reconstituted wood based panels - Specifications - Particle board
AS/NZS 2269.0	Plywood - Structural - Part 0: Specifications

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Viking Plywood Substrate Checklist - Enviroclad
Viking Enviroclad Standard Details
Viking Enviroclad Applicator Handbook
Viking Enviroclad Product Technical Statement
Viking PDS – RhinoBond Mechanical Fastening to Enviroclad TPO
Viking Rhinobond Standard Details
Viking PDS Enviroclad Walkway Roll
Viking PDS Cav-Grip III, Low VOC Low Temperature Adhesive
Viking PDS Enviroclad TPO pourable sealer pockets and pourable sealer
Viking PDS Viking Surface Sealer
Viking PDS AFS Low Profile Barge Flashing System
Viking Technical Note Flood Testing
Viking Technical Note Venting
BRANZ Appraisal 656 - Enviroclad Roofing Membrane
CodeMark Certificate Number 30058 Rev E - Viking Enviroclad Roofing and Deck Membrane System
BRANZ Appraisal 946- Strandsarking® for Low Slope Membrane Roofs

Copies of the above literature are available from Viking Roofspec

Web:	www.vikingroofspec.co.nz
Email:	info@vikingroofspec.co.nz
Telephone:	0800 729 799

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years:	For Viking **Enviroclad** Membrane

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- Provide this warranty on the Viking Enviroclad Membrane Product Warranty standard form.
- Commence the warranty from the date of completion of fixing.

Refer to the section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	For **Enviroclad** membrane when installed by Viking Approved Applicator with Viking Licensed Installer Stage 1 minimum

- Provide this warranty in the Certificate of Workmanship form in support of a Viking Roofspec Product Warranty..
- Commence the warranty from the date of completion of fixing.

Refer to the section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Installation of the membrane to be carried out by Viking Licensed Installers holding a minimum Viking Stage 1 Licence. Installation of substrates must be completed by suitably qualified persons in accordance with instructions given in Manufacturers Technical Literature and BRANZ Appraisal 656 - **Enviroclad** Roofing Membrane.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Performance

1.8 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed Viking Enviroclad system, including all penetrations through the roof and junctions with walls and parapets. All penetrations to comply with Viking Roofspec recommendations and standard details.

2 PRODUCTS

Materials

2.1 ENVIROCLAD WATERPROOFING MEMBRANE

Polyester reinforced thermoplastic polyolefin (TPO) membrane. Refer to SELECTIONS for size and colour options.

Components

2.2 ADHESIVE

Sureweld Bonding Adhesive - proprietary solvent based contact adhesive.

2.3 ADHESIVE, LOW TEMPERATURES /LOW VOC

Viking Cav-Grip III – proprietary low VOC, low temperature solvent based contact adhesive.

2.4 ENVIROCLAD CUT EDGE SEALANT (CLEAR)

Proprietary sealant for sealing cut edges.

2.5 WATER CUT-OFF MASTIC

Mastic Sealant for use at compression terminations, drains and beneath metal edging.

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2.6 ENVIROCLAD UNIVERSAL SEALANT

UV stable sealant for use in exposed terminations in contact with Enviroclad Membrane (e.g. chase sealing). Available in colour white only.

2.7 ENVIROCLAD WEATHERED MEMBRANE CLEANER

Proprietary membrane cleaner. For use to clean membrane or TPO accessories prior to welding of laps or detail. Use with HP Splice Wipes.

2.8 HP SPLICE WIPES

Proprietary wipes for use with Enviroclad Weathered Membrane Cleaner to properly clean and prepare membrane and accessories prior to welding.

2.9 ENVIROCLAD OUTSIDE AND INSIDE CORNERS

Proprietary non-reinforced moulded TPO flashings to be welded as internal and external corners.

2.10 ENVIROCLAD NON-REINFORCED MEMBRANE

Proprietary non-reinforced TPO membrane or detailing. Available in grey and white in 300mm x 15.2m and other colours in 610mm wide x lineal metre.

2.11 ENVIROCLAD T-JOINT COVERS

Proprietary unreinforced TPO disks.

2.12 ENVIROCLAD PIPE SEAL

Proprietary non-reinforced moulded TPO flashings for sealing pipe penetrations. Sized for 19mm – 205mm diameter round penetrations. Suitable for maximum sustained temperature of 70°C.

2.13 ENVIROCLAD SPLIT PIPE BOOT

Proprietary split pipe boot for sealing in-situ round penetrations 80mm or 100mm, Suitable for maximum sustained temperature of 70°C. Colour: Grey

2.14 ENVIROCLAD TPO POURABLE SEALER POCKETS

Proprietary non-reinforced moulded TPO surrounds for encasing odd shaped or multiple pipe penetrations of maximum size 100mm x 250mm.

2.15 ENVIROCLAD WHITE ONE-PART POURABLE SEALER

Proprietary white pourable sealer for filling of Enviroclad TPO pourable sealer pocket or manufactured surrounds. Suitable for sustained service temperature of --29°C to 90°C. Use with WeatherBOND Multipurpose Primer.

2.16 PRIMER

WeatherBOND Primer SEC034 for priming all surfaces receiving Enviroclad White One-Part Pourable Sealer and for use with laptape.

2.17 LAPTAPE

Laptape SMT076V use for under-flashings or drip edge detail when required. Use with WeatherBOND Multipurpose Primer.

Accessories

2.18 ENVIROCLAD SCUPPER OUTLETS

TPO scuppers. 100mm x 65mm, 100mm x 100mm or 200mm x 80mm outlets.

2.19 LEAF AND GRAVEL GRATES

Viking Gravel/Leaf Grates.

2.20 CLAMP RING ROOF DRAINS OR OVERFLOWS

80mm, 100mm or 150mm clamp sealed drains and overflows.



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3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Take delivery of Enviroclad membrane in rolls undamaged and include for site handling facilities where required. Store rolls horizontally only. Provide dry storage for all products. Stack off the ground on a level surface and with accessories.

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.

Confirm the moisture content of substrates:

Concrete:	Relative humidity of 75% maximum
Plywood / timber substrate:	Moisture Content of 20% maximum

3.4 WEATHER

Lay Enviroclad membrane in fair weather, with ambient air temperature no less than 7°C when using Viking Sure-Weld adhesive. Cooler climates may require use of Viking Gav-Grip III adhesive or RhinoBond mechanical fixing, refer to Product Data Sheet for suitable temperature range for installation.

3.5 EQUIPMENT

Equipment to be used:

- Suitable welding equipment
- Hand rollers for welding
- Seam probe
- 35kg + roller for use with adhesive applied membrane
- Magnetic heat sink poles for Rhinobond
- Rhinobond Induction welder

Application - General / preparation

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 GENERALLY

All work and materials to comply with current Viking Enviroclad technical literature and standard details.

3.8 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, provision of battens and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. The substrate to be smooth, clean, dry and stable.

3.9 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate, including sumps, outlets, overflows and projections, will ensure work of the required standard. Ensure substrate falls comply with the consented plans and details, including positive watershed to drainage outlets or external spouting to avoid ponding.

- Ensure roofs to a minimum fall of 1:30 (2°) to NZBC E2/AS1, 8.5.1 a.
- Ensure decks to a minimum of 1:40 (1.5°) to NZBC E2/AS1, 8.5.1 b.
- Ensure gutters to a minimum fall of 1:100 (0.5°) to NZBC E2/AS1, 8.5.1 c

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3.10 PLYWOOD SUBSTRATE

Ensure installation to requirements of current Viking Roofspec Plywood Substrate Checklist - Enviroclad.

Plywood to be;
- a minimum of 17mm thick and complying with AS/NZS 2269.0
- minimum CD structural grade with the sanded C side upwards
- H3.2 treated (CCA) to AS/NZS 1604.1, and kiln dried afterwards.

Lay plywood with staggered joints (brick bond) with all edges of the sheets fully supported. Do not use tongue and groove plywood.
Leave a 3mm gap between all sheets. Fix with 10 gauge x 50mm stainless steel countersunk screws. Fix at 50mm from the corners, 150mm centres on edges and 200mm centres on all intermediate supports. No triangular fillets are to be used at upstand transitions. Chamfer all external edges with a minimum radius of 5mm where the membrane is to be wrapped over. Provide falls to a minimum of those stated in NZBC E2/AS1, 8.5.1, - 1:30 for roofs, 1:40 for decks and 1:100 for internal gutters.

Plywood and the timber substructure to have a maximum moisture content of 20% when the membrane is installed.

3.11 INSTALL DRAINAGE ACCESSORIES

Install all selected proprietary clamped drains, scuppers, overflows and sumps in accordance with the manufacturer's installation requirements.

Application - laying

3.12 GENERAL

Install to current application standards as detailed in Viking Roofspec Technical literature and Viking **Enviroclad** Applicators Handbook.

3.13 SUBSTRATE PREPARATION

Substrate to be clean and dry before application of the waterproofing membrane.

3.14 POSITION AND RELAX

Membrane to be unrolled onto the prepared substrate and allowed to relax for at least 20 minutes prior to installation. Position membrane over acceptable substrate and fold membrane back to expose half of the underside.

3.15 LAP JOINTS

Install adjoining **Enviroclad** membrane sheets in the same manner, overlapping edges to provide a minimum 40mm hot air weld.

3.16 APPLY ADHESIVE - SUREWELD

Apply SureWeld Bonding Adhesive, to the exposed underside of the membrane and to the corresponding substrate, using a plastic core medium nap paint roller at a coverage rate of 2m² per litre (includes coverage on both membrane and substrate).

3.17 APPLY ADHESIVE – CAV-GRIP III

Apply Cav-GRIP III, spray applied bonding adhesive, to the exposed underside of the membrane and to the corresponding substrate, at a coverage rate of 90m² per cylinder (includes coverage on both membrane and substrate).

3.18 INSTALL MEMBRANE SHEETS - ENVIROCLAD ADHESIVE FIXED

Allow adhesive to flash off until tacky without transfer to a dry finger. Lay the glued Enviroclad membrane onto the glued substrate. Brush down the bonded section of Enviroclad membrane immediately with a soft bristle broom. Fold back the unglued half of the sheet and repeat procedure. Roll membrane to field area with 35kg roller to ensure full contact of adhesive.

3.19 MEMBRANE CLEANER

Ensure that all membrane, including accessories, to be welded is cleaned using Weathered Membrane Cleaner. Wipe the surface where the **Enviroclad** membrane cleaner has been applied with a clean, dry HP Splice Wipe to remove residue prior to welding.

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3.20 HOT AIR WELD

Clean all weld areas with Weathered Membrane Cleaner. Then weld the adjoining **Enviroclad** membrane sheets (minimum width of weld is 40mm).

3.21 INSPECT

Inspect and test joints all welds using a seam probe. Repair all breaches immediately while clean. Seal all cut reinforced membrane edges using Cut Edge Sealer, or penny roll the cut membrane edge using the correct welding technique.

3.22 PENETRATIONS AND JUNCTIONS

Form and finish upstands, downturns, penetrations, outlets and vents to conform to current Viking Roofspec Standard Details. Confirm installation of all required flashings and terminations, to leave membrane watertight upon project completion.

Finishing

3.23 PROTECTION CONSTRUCTION TRAFFIC

Protect completed areas of roof. Keep foot traffic to a minimum after laying the membrane. Lay protection / access boards as required for material storage, foot traffic or later works and remove when no longer required. Provide soft protection such as Viking Membrane Protection mat under hard protection access boards such as 17mm plywood.

3.24 ACCEPTANCE

Inspect the completed work. Protect and maintain roofing until completion of the contract works.

3.25 SUBSEQUENT WORK

Make good any damage and repair to Viking Roofspec specifications.

Completion

3.26 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.

4.1 VIKING ENVIROCLAD MEMBRANE – ADHESIVE FIXED

Brand/type:	**Viking Enviroclad**
Finish:	smooth
Adhesive:	Viking Sureweld or Viking Cav-Grip III spray applied (for low temperatures and low VOC)

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4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to the fabrication, supply and installation of **APL Window Solutions** residential window and door systems manufactured by either **Altherm**, **First** or **Vantage**.
It includes:

- APL Shopfront Series
- Hardware and furniture
- Flashings and sealants

1.1 ABBREVIATIONS AND TERMS

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

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC G4/AS1	Ventilation
NZBC H1/AS1-AS2	Energy efficiency
NZBC H1/VM1-VM2	Energy efficiency
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4303	Ventilation for acceptable indoor air quality
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
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 2604.05	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
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

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BRANZ BU 636	Protecting Glass From Damage

Window & Glass Association NZ (WGANZ) documents:

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

US Federal Specification:

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Altherm Specifier's Guide
First Specifier's Guide
Vantage Specifier's Guide
Vantage Guide to Fluoroset FP - Selling, Fabricating, Handling, Care and Maintenance
APL Guide to specifying powders and issuing/applying for warranties
APL Window Energy Efficiency Rating System (WEERS) Report Series

Manufacturer/supplier contact details

Company:	**APL Window Solutions**
Web:	www.altherm.co.nz www.firstwindows.co.nz www.vantage.co.nz www.aplnz.co.nz
Email:	specifiersguide@aplnz.co.nz
Telephone::	07 849 2113

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For fabrication
2 years:	For hardware

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	For installation

- 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 SHOP DRAWINGS

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

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

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

And where required the following: -

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

Where requested provide the following additional information

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

Complete shop drawing review before commencing fabrication.

1.7 NO SUBSTITUTIONS

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

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 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

1.11 PERFORMANCE - WINDOWS AND DOORS

To NZS 4211, including:

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

1.12 STRUCTURAL/WEATHER-TIGHTNESS

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

1.13 PERFORMANCE - THERMAL, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix E, Table E1.1.1 Construction R-values (R window) of selected generic windows and doors. Refer to SELECTIONS for construction R-values.

1.14 PERFORMANCE - THERMAL

Thermal performance of windows & doors to NZBC H1/AS1-AS2 & NZBC H1/VM1-VM2. The construction R-value of windows & doors determined in accordance with Appendix E, E1 Vertical windows and doors:

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- Determine the thermal transmittance of window & doors in accordance with ISO 10077-1.
- Determine the thermal transmittance of framing in accordance with ISO 10077-2.
- Determine the thermal transmittance of glazing using BS EN 673.

Refer to SELECTIONS for construction R-values.

1.15 PASSIVE VENTILATION

To NZBC G4/AS1, 1.3.5, **Trickle ventilators** and NZS 4303.

Performance - Wind (design by contractor)

1.16 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of NZS 3604, table 5.1.

Refer to SELECTIONS for wind zone.

Finishes

1.17 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/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.

The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2 PRODUCTS

Materials

2.1 ALUMINIUM EXTRUSIONS

Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.

2.2 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

2.3 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.4 GLASS

Refer to the glazing section for glass types and installation.

Reveals

2.5 REVEALS - TIMBER PAINTED

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

Flashings

2.6 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components for installation - cavity systems

2.7 STANDARD CAVITY CLOSER

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

2.8 SUPPORT BAR

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

Components

2.9 GLAZING GASKETS

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

2.10 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.

2.11 FIXING BRACKETS

Designed by manufacturer to specific design.

2.12 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.

Finishes

2.13 DURALLOY POWDER COATED ALUMINIUM

Polyester powder organic coating in accordance with WGANZ PQAS and AAMA 2603.

3 EXECUTION

Conditions - generally

3.1 DO NOT DELIVER

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

3.2 UNLOAD WINDOW JOINERY

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

3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE

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

3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS

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

3.7 ADDITIONAL PROTECTION

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

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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. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

3.9 INSTALLATION FIXING

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

Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

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

3.11 TIMBER / PVC REVEALS

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

3.12 HARDWARE GENERALLY

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

Installation - windows and doors

3.13 SUPPLY OF FIXINGS

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

3.14 EXPOSED FIXINGS AND FASTENINGS

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

3.15 PROTECTED FIXINGS AND FASTENINGS

Fixings and fastenings not exposed to the weather may be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

3.16 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.

3.17 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

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

Required preparatory work includes the following:

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



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3.18 INSTALLATION

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

3.19 INSTALLATION CAVITY CONSTRUCTION

Install to WGANZ Window Installation Guide details and drawings including WGANZ sill support bars.

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

3.20 INSTALL FLASHINGS

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

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

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

3.21 COMPLETE AIR SEAL

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

3.22 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.23 SEAL FRAMES ON SITE

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

3.24 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.

3.25 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.

3.26 SEALANT FINISH

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

Cleaning

3.27 REMOVE TRADE DEBRIS

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

3.28 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.



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Completion

3.29 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.

Anodised finishes should be protected from cement products and require immediate clean-up of cement splashes. Only use tapes that have passed WGANZ testing on powder coated products. Remove protection on completion.

3.30 REPLACE

Replace damaged, cracked or marked elements.

3.31 PROTECTION

Protect finishes against damage from adjacent and following work.

3.32 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM

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

3.33 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.

3.34 MANIFESTATIONS

To NZS 4223.3, 2.2 Manifestation (making glass visible).

4 SELECTIONS

See drawings.

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4711P PINK® BATTS® THERMAL INSULATION

1 GENERAL

This section relates to Comfortech Building Performance Solutions® Pink® Batts® thermal insulation materials for walls, floors, ceilings and roofs.

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:

BIB	Building Insulation Blanket

Documents

1.2 DOCUMENTS

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

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

1.3 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® Ceiling Product & Insulation Guide (June 2025)
Comfortech Pink® Batts® Wall Insulation Product & Installation Guide (Jan 2025)
Comfortech Pink® Batts® Superbatts® Installation Instructions
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

Warranties

1.4 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.

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1.5 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

1.6 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 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.

Performance

1.9 FIRE PROPERTIES

Pink® Batts® insulation products are classified as non-combustible when tested to NZS/AS 1530.1 and achieve a Group Number of 1-S.

2 PRODUCTS

Materials

2.1 PINK® BATTS® 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.

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 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.4 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 instruction 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.

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3.5 INSULATION CLEARANCES

Provide insulation clearances to NZS 4246 and for recessed luminaires AS/NZS 3000, 4.5.3.2. 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.

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.

3.11 INSTALL PINK® BATTS® TIMBER WALL INSULATION

Friction fit insulation slabs between framing.

3.12 INSTALL PINK® BATTS® CEILING INSULATION

Friction fit insulation slabs between framing. Maintain a 25mm gap clearance between the insulation slabs and roof underlay. Install to the midpoint of the top plate.

3.13 INSTALL PINK® BATTS® 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.

3.14 INSTALL PINK® BATTS® 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.

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

REFER TO DRAWINGS

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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.

Documents

1.1 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 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

1.2 QUALIFICATIONS

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

1.3 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.4 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 1: Durability Requirements of Nominated Building Elements and NZBC E2/AS1 Table 20 Material selection.

1.5 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1 Table 20 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 21 and NZBC E2/AS1 table 22.

1.6 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. 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, 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, 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 7 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.

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5113G GIB® PLASTERBOARD LININGS

1 GENERAL

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

- standard systems
- superior finish quality systems
- bracing systems
- wet area systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

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
NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600:2005	Cold-formed steel structures
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH	Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:

GIB® Site Guide (September 2018)
GIB® Wet Area Systems (April 2021)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 427 GIB® Wet Area Systems
BRANZ Appraisal 928 GIB EzyBrace® Systems

GreenTag Certification WWL:G102:2021:GR - GreenTag™ GreenRate Level A for:
GIB® Standard (10mm & 13mm)

GreenTag Certification WWL:G103:2021:GR - GreenTag™ GreenRate Level C for:
GIB Ultraline® (10mm & 13mm)

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Manufacturer/supplier contact details
Company: Winstone Wallboards
Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.4 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

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

Performance

1.5 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

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

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

1.6 BRACING REQUIREMENTS

Braced wall systems to NZS 3604 when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems (2016) and/or GIB Ezybrace® Bracing Design Software
- GIB Ezybrace® Bracing Supplement Document (December 2016)
- GIB Ezybrace® for Steel Frame Housing (NASH) Software 2011 (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

Refer to drawings for location and type.

1.7 SURFACE FIRE PROPERTIES - UNFINISHED BOARD

All GIB® unfinished plasterboard sheet materials achieve a Group Classification of, Group 1-S to NZBC C/AS2, Table 4.3, following testing in accordance with ISO 5660.1 and ISO 5660.2.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard
GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard

Components

2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

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Refer to GIB® requirements for appropriate details.

2.3 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.4 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.5 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

2.6 ADHESIVE

Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.7 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi
Cove:	GIB-Cove® Bond

2.8 JOINTING TAPE

GIB® jointing tape.

2.9 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible 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 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.4 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.



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"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.5 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (September 2018).

3.6 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1 and GIB® Site Guide (Sept 2018).

3.7 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Sept 2018).

Application

3.8 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide (September 2018). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.9 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.10 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.11 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems (2016)

3.12 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide (September 2018) requirements.

3.13 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY

To GIB® Site Guide (September 2018) and AS/NZS 2589.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

4 SELECTIONS

4.1 SEE ARCHITECTURAL & STRUCTURAL DRAWINGS.



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5311TR T&R INTERIOR SYSTEMS - CEILINGS

1 GENERAL

This section relates to the manufacture, supply and installation of **T&R Interior Systems Limited** ceiling systems.
It includes:

- acoustic suspended ceiling systems
- high performance acoustic suspended ceiling systems
- direct fixed acoustic ceiling systems
- specialty suspended ceiling systems
- all elements offered by the manufacturer to complete the systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

NRC	Noise reduction coefficient
CAC	Ceiling attenuation class
CBI	CBI Europe: Hi-Tech Interiors
STC	Sound transmission class
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc

Documents

1.2 DOCUMENTS

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

NZBC B1/VM1	Structure general
NZBC B2/AS1	Durability
NZBC C/AS1-AS2	Protection from fire
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1530.3	Methods for fire test on building materials, components and structures - Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS/NZS 2785	Suspended ceilings - Design and installation
AS/NZS 4600	Cold formed structures
NZS 3604	Timber-framed buildings
NZS 4219	Seismic performance of engineering systems in buildings
NZS 4541	Automatic fire sprinkler systems
ASTM E413	Classification for rating sound insulation
ASTM C423	Test method for sound absorption and sound absorption coefficients by the reverberation room method
ASTM E1477-98	Standard test method for luminous reflectance of acoustical materials by use of integrating-sphere reflectometers
JC/T670-2005	Mineral wool decorating and acoustic ceilings
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

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Bosk Panels - Product specification details
Daiken Harmony Hospitone - Product specification details
Eclipse Aluminium Baffles - Product specification details
Fenta Ceiling tiles - Product specification details
FLOC 3D tiles - Product specification details
Focus Various Product - Product specification details
Metacoustic Tile - Product specification details
Phonic Various Product - Product specification details

CBI Grid Suspension system - specification details
Gridlux LED Lighting - specification details
T&R 15mm & 24mm Two Way Exposed CBI Grid Product specification details
STRATOBRACE® Seismic Ceiling Bracing specification details

NZWTA fire test Report 1298611.3 T&R Interior Systems PHONIC GLASSWOOL
NZWTA fire test Report 1298614.7 T&R Interior Systems PHONIC IMPACT / TECH
NZWTA Fire Test Report FH 1298612.1 T&R Interior Systems PHONIC MINERAL FIBRE
BRANZ Fire Test Report 6248TT T&R Interior Systems FOCUS
NZWTA Fire Test Report 1297290.7 T&R Interior Systems Floc 3D
NZWTA Fire Test Report FH 1298613.9 T&R Interior Systems GYPSUM VINYL
BRANZ Fire Test Report FH 5070 T&R Interior Systems PHONIC CLEAN

Manufacturer/supplier contact details

Company:	**T&R Interior Systems Limited**
Web:	www.tr-interiorsystems.co.nz www.tris.co.nz
Email:	info@tr-interiorsystems.co.nz
Telephone:	04 499 5915 Wellington 09 571 0395 Auckland 03 366 2507 Christchurch

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

30 years:	For T&G Interior Systems ceiling tiles & panels except Bosk timber & Phonic Clean
30 years:	For T&R Two Way Exposed CBI Grid System & Concealed Plasterboard Suspension Grid
10 years:	For Timber Bosk Panel Acoustic and Decorative Panels
10 years:	For Phonic Clean Acoustic panels
5 years:	For T&R Gridlux LED modules

- Provide this warranty on T&R Interior Systems Limited standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS - GENERAL

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Provide evidence of experience, listing completed projects of similar size and complexity. Installers are to be members of the AWCINZ.

1.6 NO SUBSTITUTIONS

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

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1.7 SPECIFIC DESIGN DOCUMENTS, BY T&R INTERIOR SYSTEMS

Refer to SELECTIONS for project specific design documentation by T&R Interior Systems, generally consisting of:

- Design calculations
- Dimensioned plans/elevations of elements
- Details of construction, connections and support systems
- Dimensions of all typical elements
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Provision for thermal and seismic movement
- Bracing requirements, due to wind and seismic loads
- A schedule of materials, finishes and componentry

1.8 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 draft as-built information prior to practical completion
- Provide final as-built information prior to the end of the defects liability period.

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:

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

compliance information

1.10 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier warranty.
- Producer Statement (PS1) - Design from supplier independent engineer
- Producer Statement (PS3) - Construction from the applicator / installer.
- Producer Statement (PS4) - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

performance

1.11 LOADING CODE REQUIREMENT

To AS/NZS 2785, comply with the requirements of; AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, NZS 1170.5, NZBC B1/VM1, as appropriate.

1.12 CERTIFICATION

Provide:

- certificates and other evidence that the system complies with the standards or performance specified.
- Producer Statements, as required.

1.13 ACOUSTIC REQUIREMENTS

Use an independent testing authority to test a specimen of the ceiling system to AS/NZS 2785, 2.6 Acoustic Requirements, and submit the results for acceptance.

Refer to SELECTIONS.

1.14 FIRE HAZARD PROPERTIES

Ceiling tiles to provide a maximum Group Number to NZBC C/AS2, Table 4.3 Surface Finishes, to suit the appropriate fire risk group.

Refer to SELECTIONS for product options.

1.15 ENVIRONMENTAL REQUIREMENTS

Durability to NZBC B2/AS1



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Design the ceiling system for use over its expected life without deterioration within the required temperature and humidity range. Refer to SELECTIONS for details.

1.16 REFLECTANCE

Refer to SELECTIONS

Performance - Wind (design by contractor)

1.17 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

To AS/NZS 2785, design the installation to the wind pressure parameters of AS/NZS 1170.2.

Refer to General section 1220 PROJECT for general details.
Refer to SELECTIONS specific design performance requirements.

Performance - Seismic (design by contractor)

1.18 SEISMIC - SPECIFIC DESIGN

To AS/NZS 2785, design the system and its anchorages/fixings to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5.

Refer to General section 1220 PROJECT for general details.
Refer to SELECTIONS specific design performance requirements.

2 PRODUCTS

suspension system - two-way exposed grid

2.1 CBI GRID SUSPENSION SYSTEM

Distributed by T&R Interior Systems Limited throughout New Zealand. CBI Main and Cross Tees manufactured from hot dip galvanized steel in a double web, balanced tee design in 3700mm lengths and finished with a pre-painted steel cap. Main Tee is punched at 100mm centres and includes suspension points in both the bulb and web. Hold down clips are available as required.

Tested to NZS 4219, AS/NZS 2785, and NZS 1170.5. Heavy Duty Grid.

Hot-dip galvanized steel elements to AS/NZS 2785 for carrying ceiling tiles/panels, light fixtures and air distribution elements and complying with NZS 1170.5, section 8. Including perimeter trim, expansion joints and seismic joints etc. to AS/NZS 2785.
Refer to SELECTIONS for options.

2.2 PERIMETER TRIM

Hot-dip galvanized pre-painted steel perimeter trim, supplied by T&R Interior Systems Limited. If this forms part of the seismic system, refer to seismic calculation sheet for details.

2.3 T&R SEISMIC SEPARATION JOINT

Aluminium Extrusion to seismically separate a suspended ceiling.

Used in conjunction with CBI grid as part of the T&R Seismic Design System. Available in White, Black, and other powder coat colours on indent. New Zealand Registered design to Design Registration #: 420992.

2.4 T&R GRIDLUX LED LIGHT

GRIDLUX T Rail, extruded aluminium light fitting that replaces the crosstee of a suspended ceiling grid. LED longlife lights, low glare rating for chrome optic (UGR=19) and variable chips including CRI chip to suit application. Engineered to be part of seismic suspended ceiling system. Supplied as unit with LED Tridonic driver, clips and extensions. Compatible with DALI. Runs on 240V.

Must be used in conjunction with CBI grid as part of the T&R Seismic Design System or with USG Heavy Duty grid (38mm).
Note: Must be installed by ceiling installer. Available in opal, white optic and chrome optic, 1200mm and 600mm. 3000k, 4000k, 5000k. Sold in unit packs of 1200mm.
Available in black or white, other powder coat colours on indent.

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suspension system - seismic restraint

2.5 SEISMIC RESTRAINT

To AS/NZS 2785, 4.3.3 Seismic Restraint Types and/or suitable proprietary back braces for ceiling systems.

STRATOBRACE® seismic ceiling bracing for two-way exposed grid ceiling systems providing 2.45kN of bracing capacity. Complies with AS/NZS 2785, AS/NZS 1170.5, AS/NZS 4219 and AS/NZS 4600. 64mm and 92mm steel studs used for bracing arms and compression post.

ceiling tiles - suspended

2.6 T&R MINERAL FIBRE - PHONIC FINE FISSURED

Phonic Fine Fissured, Excel - Tone MR Mineral Fibre, a suspended ceiling tile with a non-directional, fine-fissured, surface and a clean white finish.

Tested to ASTM C423, ASTM E1477-98, ISO 5660.1. Available in 15mm thick square, edge in sizes 1200mm x 600mm and 600mm x 600mm. Suits a 24mm grid suspension system. Refer to SELECTIONS for options.

2.7 T&R MINERAL FIBRE - PHONIC HARMONY

Phonic Harmony, Excel - Tone, a suspended ceiling tile with a subtle fibre texture and monolithic finish. Tested to ASTM E413, ASTM C423, ISO 5660.1. Available in 19mm thick square edge and 19mm thick reveal edge, in sizes 1200mm x 600mm, and 600mm x 600mm.

Refer to SELECTIONS for options.

2.8 T&R MINERAL FIBRE - PHONIC NDF

Phonic NDF, Excel - Tone MR Mineral Fibre, a suspended ceiling tile with a non-directional fissured surface and a clean white finish.

Tested to ASTM C423, ASTM E1477-98, ISO 5660.1. Available in 15mm thick square edge and 15mm thick rebated edge, in sizes 1200mm x 600mm and 600mm x 600mm. Suits a 24mm grid suspension system. Refer to SELECTIONS for options.

Accessories

2.9 ACCESS HATCHES

T&R Interior Systems Limited access panels and ceiling access hatches. Refer to SELECTIONS for type and finish.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 CO-ORDINATE SERVICES

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

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

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Services and other attachments, attached to or supported by the ceiling grid system to AS/NZS 2785, ensure that:
- items over 7.5kg and items under 7.5kg but falling greater than 3m, require a tether to AS/NZS 2785, anchored to structure.
- items attached to the ceiling grid must be under 10kg mass, items over 10kg cannot be attached to the grid and must be independently supported.
- unless designed otherwise, the ceiling systems total load of services and other attachments must not exceed 3kg/m².
- light fittings installed to AS/NZS 2785 and NZS 4219.
- ceiling system clearances to structure and services etc. that are not attached to the ceiling system, to be to NZS 4219, and/or NZS 4541 for sprinklers.

3.5 SITE CONDITIONS

Do not begin installation until the building is closed in, fully glazed, the roof watertight, the atmospheric conditions within the manufacturer guidelines, and mechanical and electrical duct work above the ceiling completed. To AS/NZS 2785, Appendix C, Site Conditions, Installation, and Inspections.

3.6 RESPONSIBILITY

Ensure that conditions are suitable for the ceiling installation. Arrange for the programming of the work to suit required practice.

Installation - general

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 INSTALLATION - GENERAL

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

Allowance for support members:
- Space required by the loads on the system and the type of ceiling.
- For the installation of services and accessories, including ductwork, light fittings, and diffusers.
- Additional back support or suspension members for the fixing of services and accessories to prevent distortion, overloading or excessive vertical deflection.
- For access for maintenance of services.

Allowance for a ceiling system where failure of any one suspension point does not cause a progressive failure of the ceiling.
Allowance for height adjustment with a length adjustment device at each suspension point, permitting length variation of at least 50 mm.

If required, allow for notch grid members at the junction with the perimeter trim to make sure the ceiling units lie flat on the perimeter trim.
Do not attach the suspension system to the lip or flange of purlins.

Fix, erect and fit to finish rigid, plumb, square and true to line and face. Where components required cutting on site, use metal snips, fine-toothed band or hack saws.

Install all movement joints required.

Services support to conform to the following:
- If the service has not been designed to accept the ceiling load, do not fix suspension members to services (e.g., ductwork).
- If services obstruct the ceiling supports, provide bridging and suspension on each side of the services.
- Do not support services terminals on ceiling tiles/units.

3.9 INSTALLATION - SPECIFIC

Refer to SELECTIONS for T&R project specific design documentation.

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3.10 INSTALL SEISMIC RESTRAINTS

Install ceiling system seismic restrains and bracing as required to prevent lateral movement and resist the imposed horizontal seismic force, to AS/NZS 2785.

3.11 ACCESSIBILITY

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

3.12 PENETRATIONS

To AS/NZS 2785 and NZS 4219 generally, with sprinkler systems to NZS 4219 and/or NZS 4541.

Accommodate recessed light fittings, air conditioning outlets and other electrical and/or mechanical services that are fixed to or pass through the ceiling system. Provide independent support and/or required clearances for these as necessary. Such fittings are not to be supported by the acoustic ceiling panels.

3.13 RETURN AIR PLENUM

Tiles to prevent release of fibre into the ceiling space, air conditioning or ventilation system. Clip tile down to the grid to stop lifting if required.

3.14 PROTECT EXISTING WORK

Protect adjacent existing work from damage during the installation.

Installation - suspended tile systems

3.15 INSTALL SUSPENDED CEILING TILES

Install the system in accordance to AS/NZS 2785 and T&R Interior Systems Limited installation requirements.

- Main contractor must install a continuous nog at the ceiling height where suspended ceilings are fixed to the perimeter walls. Refer to T&R Interior Systems for installation details.
- For Seismic Design, Float two sides minimum, or float entire ceiling when back bracing or rigid hangers are required.
- Where floating ceiling is selected a T&R 'Z Rail' or Floating wall angle is to be used in conjunction with perimeter ceiling grid.
- For Impact tile installation to withstand knocks, install one (or two) furring channels running perpendicular to the Main Tees across the back of the tile. Fix to Main Tees with Robo Clips. Use two furring channels in high impact zones.

Note: Cross nogging is not permitted.

Installation- seismic ceiling bracing

3.16 INSTALL SEISMIC CEILING BRACING

Install STRATOBRACE®; seismic ceiling bracing in accordance with T&R Interior Systems requirements and details, within the parameters of AS/NZS 1170.5, AS/NZS 4219 and AS/NZS 2785. Refer to Plenum Height Chart for plenum height, 45º stud lengths and bracing requirements. PS1 can be issued for this product if required by BCA.

Completion & Commissioning

3.17 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to www.tris.co.nz
Substitutions are not permitted to the following, unless stated otherwise.
See also drawings and attached manufacturer's documents.

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5811 SIGNS & DISPLAYS

1 GENERAL

This section relates to the supply and fixing of signs and displays, for internal and external applications.
It includes;

- Vinyl sign systems
- Engraved, individual letter, Braille, traffic and pylon sign systems
- Illuminated sign systems, general signs and emergency exit signs
- Custom design and made signs

Documents

1.1 DOCUMENTS

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

NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
AS/NZS 1428.4	Design for access and mobility - tactile indicators
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS/NZS 2293.2:1995	Emergency evacuation lighting and exit signs for buildings - Inspection and maintenance
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 8603	Design and application of outdoor recreation symbols
NZS 9201.8	Model general bylaws - control of advertising signs
MOTSAM.1	NZTA Manual of traffic signs and markings - Part 1: traffic signs.
NZTA TCD	Traffic Control Devices Manual (TCD manual)

Note; MOTSAM 1 (& MOTSAM 2) is partly superseded by parts of NZTA TCD, so MOTSAM and TCD may have to be read together. In case of conflict NZTA TCD takes precedence.

Warranties

Requirements

1.2 QUALIFICATIONS

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

1.3 NO SUBSTITUTIONS

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

1.4 SHOP DRAWINGS

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

Submit shop drawings for review to:

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

1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the general operation and maintenance information as electronic PDF format documents:

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Provide this information prior to practical completion.

1.6 OPERATION AND MAINTENANCE MANUALS

Refer to the general section 1239 OPERATION & MAINTENANCE for the requirements for submission and review of operation and maintenance manuals.

Provide the operation and maintenance manual(s):

Compliance information

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor Manufacturer's, importer's or distributors warranty
- Installer / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Producer Statement - Construction Review from an acceptable suitably qualified person

Performance

1.8 DESIGN - GENERAL

Signage to comply with NZBC F8/AS1 for escape routes, emergency related safety features, potential hazards and accessible routes and facilities for people with disabilities. Pictograms to NZBC F8/AS1, 2.4 **Pictograms.** Emergency illuminated signs also to NZBC F6/AS1 and AS 2293.1.

1.9 DESIGN - ADVERTISING

Design the signage to comply with NZS 9201.8.

1.10 TESTING ILLUMINATED EMERGENCY SIGNS

On completion of the installation, co-ordinate testing with the testing of the whole emergency lighting system to the procedure in AS/NZS 2293.2 and the requirements of AS 2293.1.

1.11 CERTIFICATE OF COMPLIANCE ILLUMINATED EMERGENCY SIGNS

Provide a certificate of compliance and provide a log book to AS/NZS 2293.2. Co-ordinate this with the whole emergency lighting system requirements.

2 PRODUCTS

Illuminated signs

2.1 EMERGENCY EVACUATION ILLUMINATED SIGNS

Illuminated exit signs, LED based, to AS 2293.1 and AS 2293.3, maintained or non-maintained. Graphics and sign size to NZBC F8/AS1. Refer to SELECTIONS for type, model, mounting.

2.2 ILLUMINATED SIGNS CUSTOM MADE

Illuminated signs custom made to suit sign requirements. Either, face illuminated (box with translucent face) or edge lit (plastic or glass). Refer to SELECTIONS for type, size, mounting.

2.3 PHOTOLUMINESCENT SIGNS

To NZBC F8/AS1, 4.5.4, Photoluminescent signs. Provide photoluminescent signs that, in the event of a power failure, must continue to provide a luminescent sign at the prescribed level with no electrical or battery connection for the prescribed time to NZBC F6/AS1, 1.6 Duration. Text and pictograms for exit signs to comply with NZBC F8/AS1, 4.0 Exit Signs and to be in safety green to NZBC F8/AS1, 4.4.1

Sanitary signs

2.4 SANITARY SIGNS

Signs for personal hygiene facilities. Pictograms to NZBC F8/AS1, 8 Sanitary facilities, figure 15. Accessible facilities to be identified with the International Symbol for Access to NZBC F8/AS1, figure 9.

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Statutory signs

2.5 STATUTORY SIGNS

Regulatory and non-regulatory signs, wall mounted or suspended. Used for information, direction, and warnings. Refer to SELECTIONS for materials, illumination.

Components

2.6 VINYL TAPE

Vinyl Tapes with dead stretch properties and chemical and abrasion resistance. The transfer resistant rubber adhesive system is to provide immediate adhesion properties.

2.7 LIQUID ADHESIVES

Structural and non structural strength adhesives to suit system requirements.

3 EXECUTION

Conditions

3.1 DELIVERY

Only deliver to the site signs that can be immediately unloaded in to suitable storage or be placed for direct installation.

3.2 INSTALLATION

Install to manufacturers requirements, firmly and securely in locations specified on drawings.

3.3 COORDINATE

Confirm appropriate fixing points needed for each sign have been provided. Do not proceed if the appropriate fixing points or services do not match the sign requirements.

3.4 SUBSTRATES

Ensure substrates and fixings will allow work of the specified standard. Ensure finishes are complete as appropriate.

3.5 MATERIALS, FITTINGS AND EQUIPMENT

New and undamaged, of the required standard and complying with the relevant Standards, Codes and Regulations.

3.6 SIGNAGE LOCATIONS

Signage locations shown on the drawings are their actual location, but subject to verification for final height and position. Clarify the location of all elements and units relative to surrounding materials and finishes. Confirm final positioning.

Application

3.7 MOUNTING SIGNAGE

Locate and fix, ensuring they are positioned as designed, and relative to plumb and level requirements.

Completion

3.8 REPLACE DAMAGED WORK

Replace damaged, cracked or marked elements.

3.9 LEAVE CLEAN

Leave units and fittings clean and in full working order, wiring concealed and fire protected as required and with adjacent surface finishes unmarked. Leave work to the standard required by following procedures.

3.10 ENSURE CORRECT OPERATION

Ensure work is operating correctly, with equipment clean and light bulbs and tubes operational.

3.11 PROTECT

Protect items from damage or marking.



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4 SELECTIONS

Refer to drawings for details.

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6512 CARPET TILES

1 GENERAL

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

- nylon
- wool fibre
- polymer-backed

Documents

1.1 DOCUMENTS

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

NZBC C/AS2	Protection from fire
AS/NZS 2455.1	Textile floor coverings - installation practice - General
AS/NZS 2455.2	Textile floor coverings - installation practice - Carpet tiles

Warranties

Requirements

1.2 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.3 NO SUBSTITUTIONS

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

Performance

1.4 SURFACE FIRE PROPERTIES FOR FLOORING

Flooring to be non-combustible or have a Critical Radiant Flux to NZBC C/AS2, Table 4.5. Refer to SELECTIONS.

2 PRODUCTS

Materials

2.1 CARPET TILES

Nylon/wool fibre fusion-bonded to a polymer, PVC or bitumen backing.

2.2 ADHESIVE

A pressure release adhesive.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products. Keep carpet tiles dry. Protect from damage

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

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 tiles are 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 tiles 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 TEMPERATURE

Floor temperature:	Minimum 16°C.
Concrete pH:	No more than 10.0.
Carpet tiles:	Conditioned at 16°C for a minimum of 24 hours prior to installation.

3.5 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.

3.6 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.7 LAYOUT

Plan the general layout to:

- to conform with any special pattern requirements as detailed
- to maximise perimeter and cut module sizes and
- subject to any specific design instructions, to ensure that tiles are laid parallel to the longest wall.

Application - general / substrate preparation

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

Application - carpet tile laying

3.10 LAYING GENERALLY

Lay in accordance with AS/NZS 2455.1, AS/NZS 2455.2 and the carpet tile manufacturer's own installation instructions.

3.11 LAYING DIRECTION

Lay in a mono direction, except where specifically instructed otherwise.

3.12 CUTTING OF TILES

Cut tiles from the back, using the carpet tile manufacturer's required cutting technique.

Completion

3.13 PROTECTION

Provide the temporary protection of the finished work:

3.14 SPECIAL PROTECTION

Self adhesive carpet protective film: TBC



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3.15 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.
See owner for details.

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 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

1.2 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
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	Specification manual
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

Requirements

1.3 NO SUBSTITUTIONS

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

1.4 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.5 SAMPLES

Refer to the general section 1270 CONSTRUCTION for details of how samples will be reviewed and how instructions to proceed will be given.Provide samples for review

1.6 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



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- using solvent based paint removers.

1.7 MATERIAL SAFETY DATA SHEET

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

Warranties

1.8 WARRANTY

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

2 years: Warranty period

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

Performance

1.9 MANUFACTURER'S INSPECTION

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

1.10 INSPECTION OF WORK

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

2 PRODUCTS

Materials

2.1 PAINT TYPES

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

2.2 MATERIALS GENERALLY

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

2.3 THINNERS AND ADDITIVES

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

Accessories

2.4 FILLERS

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

3 EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in AS/NZS 2311, the MPNZA Specification manual, and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry.

3.2 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.3 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.



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3.4 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.5 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.6 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.7 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.8 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior
For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.
Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior
For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.
Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.9 ANCILLARY SURFACES

The coatings listed in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

3.10 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.11 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - unpainted and pre-primed timber and wood based products

3.12 MOISTURE CONTENT

Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.

3.13 PREPARING DRESSED TIMBER

Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.

3.14 PREPARING ROUGH SAWN TIMBER

Thoroughly brush along the direction of the grain to remove dust and dirt.

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3.15 PREPARING PRE-PRIMED TIMBER

Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.

3.16 TIMBER SPECIES

Check that the preparation and paint system is suitable for the timber species.

3.17 PREPARING DAMAGE AND DEFECTS

Scrape clean loose or soft material holes, depressions, resin or gum pockets, knot holes, surface splits, checks, or any localised decay. Apply primer and/or sealer specified and fill these areas with linseed oil putty or other appropriate filler.

3.18 FIXINGS

Take timber fixings below the painted or clear finished surface. Leave corrosion resistant timber fixings flush with clear finished surfaces.

3.19 CLEANING

Remove grease and oil by wiping down with solvent or water-based degreasing agent. Remove resin by wiping down with solvent or water-based degreasing agent or heating and scraping. Remove sanding dust. Bad staining may be untreatable and require replacement of timber, discuss with paint manufacturer and main contractor.

Preparation - unpainted metal

3.20 PREPARING STEEL

All steel to AS/NZS 2312.1 and structural steel also to SNZ TS 3404.

Remove loose rust and mill scale by hand-tool or power-tool cleaning. Remove more adherent rust and scale by abrasive blast cleaning or pickling. Use chemical pre-treatment to remove the last traces of rust and to inhibit rust formation.

3.21 PREPARING ZINC AND ALUMINIUM-ZINC ALLOY COATED STEEL

Remove grease, oil and other solvent soluble contaminants by wiping and/or brushing with mineral turpentine or white spirit. Wipe with a clean solvent. Allow to dry and proceed immediately with the next operation.

3.22 PREPARING ALUMINIUM

Remove grease, oil and dust by wiping and/or brushing with mineral turpentine or white spirit. Wash thoroughly using water with a few drops of detergent, then wash with clean water. Allow to dry and proceed immediately with the next operation.

Preparation - gypsum plaster

3.23 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - painted surfaces generally

3.24 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.

3.25 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.

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3.26 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty. Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Application - before applying final coatings

3.27 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.

3.28 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.

3.29 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.30 CONCEALED METAL SURFACES

Apply primer to suit the coating system to all metal surfaces which will be concealed when incorporated into the building.

3.31 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.32 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.

3.33 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

3.34 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.35 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.36 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.37 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

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- 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

3.38 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.

3.39 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.

3.40 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.

3.41 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.42 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

3.43 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.

3.44 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.

3.45 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.

3.46 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.

3.47 REPLACE HARDWARE

Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

4 SELECTIONS

4.1 SEE DRAWINGS.

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7123 HOT & COLD WATER SYSTEM

1 GENERAL

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

1.1 RELATED WORK

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC C/AS1-AS2	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1-AS2	Energy Efficiency
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe fittings - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1: 2018	Plumbing and drainage - Water services
AS/NZS 3500.4: 2018	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4607	Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617	Tempering (3-port mixing) valves
AS/NZS 5601.1	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.
Gas (Safety and Measurement) Regulations 2010	
Plumbers, Gasfitters and Drainlayers Act 2006	
NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2011, Field testing of backflow prevention devices and verification of air gaps

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Warranties

1.3 WARRANTY

Provide warranty for:

2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Supply maintenance information to requirements set out in the 1239 OPERATION & MAINTENANCE section.

1.6 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.
- 55ºC - 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

1.7 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.5, **Watertightness**, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

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2 PRODUCTS

Materials

2.1 COPPER PIPE

To NZS 3501 complete with copper-alloy compression fittings or crox type joints and seal ring compression joints complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, Table 1 and NZBC G12/AS1, Table 1.

2.2 POLYBUTYLENE PIPE

Polybutylene tubing to AS/NZS 2642.1, AS/NZS 2642.2 and AS/NZS 2642.3 complete with fittings and accessories brand-matched with durability to NZBC B2/AS1, table 1 and NZBC G12/AS1, table1. Protect from sunlight.

2.3 POLYPROPYLENE RANDOM WATER PIPE

PP-R Polypropylene pipes to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/VM1. Protect from sunlight.

2.4 CROSS LINKED POLYETHYLENE PIPE

Cross Linked Polyethylene Pipe to AS/NZS 2492 and fittings to AS/NZS 2537.2 with a minimum pressure capability of 1200 kPa complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/VM1. Except for solid black PE-X, protect from sunlight.

2.5 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, and table 2, Selection of Backflow Protection.

2.6 TEMPERING VALVE

Tempering valve to NZS 4617 to NZBC G12/AS1.

Materials - Hot water heating appliances

2.7 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305, ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

Components

2.8 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZBC H1/AS1-AS2 and AS/NZS 3500.4.

2.9 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.



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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/VM1 or NZBC G12/AS1.

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

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

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1.

3.11 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.12 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1.

3.13 JOINTING POLYPROPYLENE PIPE

Fusion weld joints to manufacturer's requirements.



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Application - Pipework installation

3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/VM1 or NZBC G12/AS1, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.

Lag all pipes with rigid insulation to the manufacturer's requirements and NZBC G12/VM1 or NZBC G12/AS1.

3.16 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to NZBC G12/AS1, 9.0.

3.17 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

3.18 PENETRATIONS

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

Application - Hot water systems

3.19 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation. Valve-vented systems to NZS 4607.

3.20 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation.

3.21 INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes to NZBC H1/AS1-AS2 Energy Efficiency, AS/NZS 3500.4, 8.2 Thermal Insulation, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.22 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11. Valve-vented systems to NZS 4607.

3.23 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to NZBC G12/AS1.

3.24 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.



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Installation - valves

3.25 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

3.26 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.27 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.28 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.29 REPLACE

Replace damaged or marked elements.

3.30 LEAVE

Leave work to the standard required by following procedures.

3.31 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

See drawings.

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7411D DIMOND RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to Dimond rainwater disposal systems including spouting and downpipes, in metal.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.2 DOCUMENTS

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

NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Dimond, Roofing and Cladding Systems Design Manual, (web based Manual with dated update pages)

Manufacturer/supplier contact details

Company:	Fletcher Steel Ltd
Trading as:	Dimond Roofing
Web:	www.dimond.co.nz
Email:	roofspec@dimond.co.nz
Telephone:	0800 346 663 (0800 DIMOND)

Requirements

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **Dimond** materials and the techniques specified.

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Dimond** maintenance information on completion of the roofing work.

Performance

1.7 TEST

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

2 PRODUCTS

Materials

2.1 SPOUTING

Complete with matching brackets to suit the spouting and screws. Refer to SELECTIONS for type.

2.2 DOWNPIPES

Complete with stand-off brackets, galvanized screw fixed. Refer to SELECTIONS for type.

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Components

2.3 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

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 suitable to fix to standard.

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 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 SPOUTING

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum or 600mm centres maximum when using profile option Box 300. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 450mm. 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 **Dimond** details and NZMRM CoP recommendations.

3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with cast zinc 115 degree angle bends as needed with all joints lapped and silicone sealed and fixed with 2-4mm diameter aluminium blind rivets. Galvanize screw fix with galvanized steel pipe clips to rigidly stand 40mm off the wall plumb and discharging into stormwater gully or inlet pipe. All installation to **Dimond** details and NZMRM CoP recommendations.

3.7 INSTALL RAINWATER HEADS

Install using suitable fixings where required to detail as shown on drawings. Ensure colour matched blind aluminium rivets are used when joining metal surfaces.

3.8 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

Completion

3.9 REPLACE

Replace damaged or marked elements.



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3.10 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.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 DIMOND SPOUTING

Profile:	Box 280
Size:	29400mm² effective cross sectional area
BMT:	0.55mm
Coating system:	Colorcote® Magnaflow™
Dimondcolour:	Ironsand

4.2 DIMOND DOWNPIPES

BMT:	0.55mm
Coating system:	Colorcote® Magnaflow™
Dimondcolour:	Ironsand

4.3 METAL RAINWATER HEADS, DROPPERS, OVERFLOWS

BMT:	0.55mm
Coating system:	Colorcote® Magnaflow™
Dimond Colour:	Ironsand

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7451AL ALLPROOF LEVEL THRESHOLD DRAINAGE SYSTEMS

1 GENERAL

This section relates to **Allproof Industries** level threshold drainage systems suitable for residential and commercial applications.
It comprises of an in-ground drainage channel complete with a range of grate options and fittings including connection to the network utility operators system.
It includes:

- Allproof Perimeter Drain
- Allproof Cantilever Bracket (CB) level threshold drainage system
- Allproof Cast-In Cantilever Bracket (CCB) level threshold drainage system
- Allproof Threaded Leg (TL) level threshold drainage system

1.1 RELATED WORK

Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters

Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage
Refer to 7461 FOUL WATER DRAINAGE for waste/foul water drainage

Documents

1.2 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 E2/AS1 External moisture
AS/NZS 3500.3: 2018 Plumbing and drainage - Stormwater drainage
Plumbers, Gasfitters and Drainlayers Act 2006

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allproof Industries Level Threshold Brochure
Allproof Industries Level Threshold Technical Details
Allproof Industries Level Threshold Installation Details

Manufacturer/supplier contact details

Company:	**Allproof Industries**
Web:	www.allproof.co.nz
Email:	info@allproof.co.nz
Telephone:	09 481 8020

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Allproof Industries Level Threshold Drainage System components. For warranty conditions and details refer to Allproof Industries.

- Provide this warranty on Allproof Industries Ltd 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.

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Requirements

1.5 QUALIFICATIONS

Drainlayers / contractors 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.

1.6 ORDERING REQUIREMENTS

Allow manufacturing / delivery lead time after on-site measurement for the following custom products:

- Allproof Cantilever Bracket (CB) System
- Allproof Cast-In Cantilever Bracket (CCB) System
- Allproof Threaded Leg (TL) level threshold drainage System

1.7 SITE CONFIRMATION

Meet with the territorial authority drainage inspector to confirm the drainage layout in relation to site conditions. Confirm changes resulting and seek written site instruction before carrying out any work.

1.8 SITE CONDITIONS

Before starting work check on site the drainage layout, dimensions, levels and invert levels and ensure that line, level, falls and cover are correct.

1.9 NO SUBSTITUTIONS

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

Performance

1.10 TECHNICAL APPLICATION

Refer to Allproof Industries for technical support on grate performance and engage a hydraulics engineer for hydraulic performance, run layout and scheduling, ponding analysis and information on the chemical resistance of the trench and grate materials.

1.11 COMPLIANCE WITH NZ BUILDING CODE

All work to comply with:

- NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction.
- NZBC E1/AS1: Surface water, 3.0 Drainage system materials and construction.

2 PRODUCTS

Materials - Allproof level threshold drainage systems

2.1 ALLPROOF PERIMETER DRAIN

Perimeter Drain level threshold drainage system, complies with NZBC E2/AS1, 7.3.2.1 **Concrete slab**, Figure 17B, a) iv), and is comprised of the following:

- L Shaped pre-cast polymer concrete channel 200mm wide x 195mm high (internal depth 180mm) with two standard and alternative grate options.

2.2 ALLPROOF THREADED LEG (TL) SYSTEM

Threaded Leg (TL) level threshold drainage system comprises of the following:

- Threaded Leg (TL) grate system with adjustable rods and plastic feet.
- Select from 2 options of grate.

3 EXECUTION

Conditions

3.1 GROUND CONDITIONS

Specific ground conditions or contaminated ground may require an increase in the concrete surround dimensions or the addition of reinforcement.

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3.2 TEMPORARY INSTALLATION

Allproof Industries level threshold drainage channels are not trafficable until fully installed. During site work and after the trench run is laid, route site traffic away from the trench. If temporary crossings are required lay base course of minimum 1 metre wide either side of the trench for protection and install temporary protective cover or timber infill for support.

Installation

3.3 GENERAL

All work to NZBC E2/AS1: Level Threshold, 7.3.2.1 system materials and construction, NZBC E1/AS2 as modified by AS/NZS 3500.3: 2018 Plumbing and drainage - Stormwater drainage and Allproof Industries Installation Details.

3.4 INSTALL ALLPROOF PERIMETER DRAIN

Install Allproof Perimeter Drain in accordance with Allproof Industries Level Threshold Technical Details, and as follows:

- Set channel up against building line. Level channel and make any cuts that are required working from the centre outwards.
- Install grates or insert timber into channel. This will reduce any movement when pouring the concrete.
- Pour concrete.
- Lay screeding towards the outlet to create a 1:200 fall in accordance with NZBC E2/AS1, 7.3.2.1 Concrete slab, Figure 17B, a) iv).
- Install grates. Cut down grates and place into the bracket keeping a 12mm distance between the bracket and the building line.

3.5 INSTALL ALLPROOF THREADED LEG (TL) SYSTEM

Install Allproof Threaded Leg (TL) System in accordance with Allproof Industries Level Threshold Technical Details, and as follows:

- Set up boxing to form 150mm high x 200mm wide channel. Ensure that concrete edge has a clean bullnose edge finish as frame will need to sit flush to edge.
- Pour concrete.
- Remove boxing.
- Adjust leg height on bracket and set into channel with 12mm stoppers against the joinery.
- Apply any last adjustments ensuring that there is a level surface with the interior floor finish / joinery and exterior surface.

Installation - connection

3.6 CONNECT TO SURFACE WATER DRAIN

Connect Allproof level threshold drainage system to stormwater drain to the requirements and satisfaction of the network utility operator.

3.7 CLEAN

Clean and flush out the whole installation and remove all silt and debris before handing over.

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.allproof.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.
See also drawings.

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8261 ROADMARKINGS & SIGNS

1 GENERAL

This section relates to the supply and application of paint on road and paved surfaces, tactile indicators and erection of traffic and information signage.

Documents

1.1 DOCUMENTS

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

AS/NZS 1428.4.1	Design for access and mobility - Means to assist the orientation of people with vision impairment - Tactile ground surface indicators
NZS 5414	Specification for the construction of traffic signs
MOTSAM.1	NZTA Manual of traffic signs and markings - Part 1: traffic signs.
MOTSAM.2	NZTA Manual of traffic signs and markings - Part 2: markings.
NZTA TCD	Traffic Control Devices Manual (TCD manual)
NZTA T12	Specification for long-life pavement marking material applicator testing
NZTA T18	Specification for roadmarking raised pavement marker (RPM) adhesive heater and thermoplastic pre-heater testing
NZTA M07	Specification for Roadmarking Paints
TNZ M/12	Specification for Raised Pavement Markers
NZTA M14	Specification for Edge Marker Posts
TNZ M/20	Thermoplastic Road-Marking Materials
TNZ P/12	Pavement Markings
TNZ P/14	Specification for Raised Pavement Markers Installation
NZTA P16	Specification for Installation of Edge Marker Posts

Note; MOTSAM 1 & MOTSAM 2 are partly superseded by parts of NZTA TCD, so MOTSAM and TCD may have to be read together. In case of conflict NZTA TCD takes precedence.

Warranties

Requirements

1.2 QUALIFICATIONS

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

Quality control and assurance

1.3 INSPECTIONS

Notify the Contract Administrator for inspection of the works following:

- Set out of road marking prior to commencing any painting
- Location of signage prior to installation.

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2 PRODUCTS

2.1 PAINT AND THERMOPLASTICS

All paint used for road marking to NZTA M07.
Paint colour to MOTSAM.1, MOTSAM.2 and NZTA TCD standards.
Thermoplastic marking material to TNZ M/20.

2.2 REFLECTIVE RAISED PAVEMENT MARKERS

Proprietary reflective raised pavement markers to TNZ M/12.

2.3 EDGE MARKER POSTS

Proprietary edge marker posts to NZTA M14.

2.4 APPLICATION

Plant shall have current certificates to NZTA T12 or NZTA T18 as applicable.

2.5 TACTILE GROUND SURFACE INDICATORS

To AS/NZS 1428.4.1. Refer to SELECTIONS for details.

2.6 SIGNPOSTS - TIMBER

Timber signposts formed from No. 1 Framing grade dressed / timber treated to H4. The posts primed and finished with two coats of white paint over the length above the ground. Post size100mm x 100mm in nominal section size.

2.7 SIGNPOSTS - ALUMINIUM

Unless specified otherwise, aluminium poles to be powder coated white, capped with powder coated top caps to match the pole.

2.8 FLEXIBLE MOUNTINGS

Signs installed on traffic islands or medians to be fixed to posts attached at the base to approved flexible mountings in accordance with MOTSAM.1 and NZTA TCD.

2.9 SIGNS

To NZS 5414 and MOTSAM.1 and NZTA TCD.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

Take delivery of materials and goods and store on site and protect from damage.

Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufactures requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 REMOVAL OF EXISTING ROAD MARKINGS

Prior to the application of new road markings, remove the existing road markings not required by wet sand blasting.

All redundant road markings, which will be overlain by the proposed works, do not have to be removed.

3.3 SURFACE PREPARATION

Remove any loose chip, dirt or other course material prior to applying any new road markings or recoating any existing road markings.

3.4 SETTING OUT

Set out the road marking ensuring that the centre, edge and lane lines are true and straight and follow curves evenly and correctly. Ensure that intersection markings and similar are set out accurately as far as dimensions and locations are required. Set out to a tolerance of ±25mm. Use appropriate methods for setting out such as chalk lines or string lines.

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Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section CONSTRUCTION for general requirements.

3.6 MARKING

All new road markings shall be completed to TNZ P/12, MOTSAM.2 and NZTA TCD. Paint shall be applied by a paint applicator, certified and operated in accordance with NZTA T12.

Use cones or other appropriate markers to protect new road markings until the paint dries.

3.7 NON-CONFORMING MARKINGS REMEDIATION

To TNZ P/12 Section 15. Non-conforming markings.

3.8 REFLECTIVE RAISED PAVEMENT MARKER

Installation to TNZ P/14.

3.9 EDGE MARKER POSTS

Installation to NZTA P16.

3.10 INSTALL TACTILE GROUND SURFACE INDICATORS

Installing tactile Ground Surface Indicators to required layout, installed to the manufacturer's requirements, and to AS/NZS1428.4..1

3.11 SIGN INSTALLATION

Erect signposts vertical and plumb to the standard heights and offsets from the kerbs as specified in MOTSAM.1 and NZTA TCD. The base of signposts shall be concreted in below the paving level, and the paving brought up flush with the signpost.

Where permitted by the Contract Administrator or as shown on the drawings, attach signs to other existing features such as lampposts.

Completion

3.12 ROUTINE CLEANING

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

3.13 DEFECTIVE OR DAMAGED WORK

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

3.14 PROTECT

Protect markings until completely dry and hard.

4 SELECTIONS

See drawings.



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