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Cadence Architectural Design

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

New Part 2 Storey Dwelling

Project Specification

17 Lost Burn Road, Hawea, Wanaka, New Zealand
Project Ref: CD206

Printed: 12 July 2025

masterspec
Specification built using Masterspec software
Project ID: 324938 - 396109

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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

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1.2 DOCUMENT DETAILS

Project Name:	New Part 2 Storey Dwelling
Project Number:	CD206
File Reference:	CD206
Client:	Jamie Blakely
Version:	1

1.3 REVISION CONTROL

Issue:	Building Consent
Revision:	-
Amendment Details:	-
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Date of Issue:	12.07.25
Reviewed by:	AJT

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1220 PROJECT

1 GENERAL

This general section describes the project including:

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

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

New part 2 storey dwelling. Main construction in NZSIP to exterior structure and traditional timber frame to interior on fully insulated concrete slab.

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

1.4 DESIGN CONSTRUCTION SAFETY

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

Principal's Health & Safety Matters

1.5 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site

1.6 LEGAL DESCRIPTION

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

1.7 SITE FEATURES

Existing secondary dwelling, drainage & water supply runs in place to service new dwelling.

Site environment - Durability

1.8 EXPOSURE ZONE

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

Site environment - Wind

1.9 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 (refer to NZS 3604, table 5.4)

Site environment - Seismic

1.10 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

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

3

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The earthquake zone is:

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1232 INTERPRETATION & DEFINITIONS

1 GENERAL

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

Definitions

1.1 DEFINITIONS

Hold point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may not proceed on that particular part until the contract administrator and any other nominated person has advised that work can continue. A notice period of 2 Working Days is required unless stated otherwise.
Notification point:	A stage of the construction where the contract administrator and any other nominated person requires notice to be given that particular work is to be carried out. Work may continue and the contract administrator and any other nominated person may choose whether or not they wish to witness the particular work being carried out. A notice period of 2 Working Days is required unless stated otherwise.
Product:	A thing or substance produced by natural process or manufacture.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Review:	Review by the contract administrator and other consultants is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under Health and Safety at Work Act 2015).

1.2 PERSONNEL

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

1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BPIR	Building Product Information Requirements
BRANZ	Building Research Association of New Zealand

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BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
OSH	Occupational Safety and Health
PCBU	Person Conducting a Business or Undertaking (under Health and Safety at Work Act 2015)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design
TA	Territorial Authority
TNZ	Transit New Zealand (Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)

1.4 DEFINED WORDS

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

1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

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1233 REFERENCED DOCUMENTS

1 GENERAL

1.1 REFERENCED DOCUMENTS

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

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

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

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

1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

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

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

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

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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.

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.

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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

Guarantees - Contractor - Master Build Services Ltd

2.1 MASTER BUILD SERVICES LTD - 10 YEAR GUARANTEE

Provide a 10 Year Guarantee, include all costs of the building in the contract price. Complete the guarantee application form, obtaining all required signatures (registered master builder and owner/s). Send the completed form to Master Build Services for approval along with a copy of the building contract (include a full scope of work for any addition/alteration work), prior to any work commencing. Obtain written confirmation from Master Build Services and provide this to the owner along with the guarantee document. On completion of the building work complete the notice of practical completion form, obtain all required signatures (registered master builder and owner/s) and send the form to Master Build Services.

2.2 MASTER BUILD SERVICES LTD - 10 YEAR MULTI-UNIT GUARANTEE

Provide a 10 Year Multi-Unit Guarantee, include all costs of the building in the contract price. Complete the guarantee application form, obtaining all required signatures (registered master builder and owner/s). Send the completed form to Master Build Services for approval, along with a copy of the building contract and architectural drawings for approval prior to any work commencing. Obtain written confirmation from Master Build Services and provide this to the owner along with the guarantee document. On completion of the building work complete the notice of practical completion form, obtain all required signatures (registered master builder and owner/s) and send the form to Master Build Services.

Guarantee - Contractor - New Zealand Certified Builders Association

2.3 HALO 10-YEAR RESIDENTIAL GUARANTEE

Complete the Halo 10-year residential guarantee insurance application process and pay the premium. Instruct the owner to return the Completion Certificate to Halo Guarantees Limited on practical completion.

Weathertightness and watertightness warranty

2.4 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.

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- 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:

3155MR	MAXRaft Floor System
3876	Structural Insulated Panel Systems (SIPS)
4161PC	Pro Clima Wall and Roof Underlays, Tapes & Accessories
4221BV	Timberline Thermory Vertical Cladding
4222WH	ITI Timspec Weathertex Horizontal Weatherboard
4239JH	James Hardie® Soffits
4311NZ	Colorsteel® Roofing
5111H	James Hardie® Fibre Cement Sheet Linings
5438H	James Hardie® Fibre Cement Secura™ Flooring
6221A	ARDEX Tiling Solutions
6700	Painting General
6721	Painting Interior
7411C	Continuous Spouting Rainwater Systems
7612	Residential Extract Systems
7701	Electrical Basic

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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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

Quality control and assurance

1.1 QUALITY ASSURANCE

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

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

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

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

1.2 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.

1.3 NOTIFIABLE WORK

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

Noise and nuisance

1.4 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.

1.5 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.

1.6 PROVIDE INFORMATION TO NEIGHBOURS

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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.

1.7 INCONVENIENCE TO OTHERS

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

1.8 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.

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 USE OF SET-OUT INSTRUMENTS

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

1.19 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.

1.20 TOLERANCES

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

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

Refer to work sections for tolerance requirements for finishes.

Execution

1.21 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.

1.22 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.

1.23 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.

1.24 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.

1.25 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.

1.26 MINIMISE DELAYS DUE TO WEATHER

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

Defective or damaged work

1.27 DEFECTIVE OR DAMAGED WORK

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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

1.28 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.

1.29 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.

1.30 HOT WORK PERMIT

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

1.31 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.

1.32 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

1.33 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.

1.34 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.

1.35 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.

1.36 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.

1.37 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.

1.38 QUALIFICATIONS – PRODUCER STATEMENTS

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

1.39 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

1.40 NEW PRODUCTS

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

1.41 COMPATIBILITY OF PRODUCTS

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

1.42 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.

1.43 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.

1.44 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.

1.45 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.

1.46 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.47 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.

Cleaning during the works

1.48 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.

1.49 TRADE CLEANING

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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

1.50 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

1.51 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.52 LEAVE WORK

Leave work to the standard required for the following procedures.

1.53 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.

1.54 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.

1.55 COMPLETE ALL SERVICES

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

1.56 CLEANING BY CONTRACTOR

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

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

Commissioning

1.57 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.58 MOVING PARTS

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

1.59 COMMISSIONING - TESTS & CERTIFICATION

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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.

1.60 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.

1.61 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

1.62 ADDITIONAL PRACTICAL COMPLETION INFORMATION

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

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

Defects period submissions

1.63 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

1.64 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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2210 PREPARATION & GROUNDWORK

1 GENERAL

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

- footings and floor slabs

Documents

1.1 DOCUMENTS

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

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

1.2 SITE SAFETY

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

2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

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

2.2 VOLCANIC TUFF FILL

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

2.3 ROCK FILL

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

2.4 SAND FILL

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

2.5 HARD FILL

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

2.6 GRANULAR FILL

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

2.7 DRESSING COURSE

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

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

3 EXECUTION

3.1 EXCAVATION GENERALLY

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

3.2 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.3 PROTECT EXISTING WORK

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

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3.4 EROSION CONTROL

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

3.5 SURFACE PREPARATION

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

3.6 STOCKPILE TOPSOIL

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

3.7 GENERAL EXCAVATION

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

3.8 ROCK EXCAVATION

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

3.9 FOUNDATION EXCAVATION

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

3.10 INADEQUATE BEARING

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

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

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

3.11 STANDARD OF COMPACTION

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

3.12 GRANULAR BASE FOR SLABS

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

3.13 GENERAL BACKFILLING

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

3.14 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

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3101 CONCRETE WORK - BASIC

1 GENERAL

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

1.1 RELATED WORK

Refer to3155MR MAXRaft Floor System for raft foundation

1.2 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

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

ACRS web site - www.steelcertification.com

Documents

1.3 DOCUMENTS

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

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

Requirements

1.4 QUALIFICATIONS

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

1.5 STEEL REINFORCING COMPLIANCE

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

2 PRODUCTS

2.1 NORMAL CONCRETE

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

2.2 REINFORCEMENT

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

2.3 MESH FOR SLABS TO NZS 3604 OR NZS 4229

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

2.4 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.5 SPACERS AND CHAIRS

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

2.6 DAMP-PROOF MEMBRANE

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

3 EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 FALSEWORK AND FORMWORK

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

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

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

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

3.3 INSTALL DAMP-PROOF MEMBRANE

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

3.4 CUT AND BEND REINFORCEMENT

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

3.5 ADJUSTMENTS

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

3.6 TOLERANCES, BENDING

To NZS 3109, 3.9, Tolerances for reinforcement.

3.7 SECURE REINFORCEMENT

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

3.8 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.

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Wire mesh laps to NZS 3101.1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.9 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

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

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

Do not count bar extensions beyond the outermost cross wire.

3.10 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

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

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

3.11 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

3.12 CASTING IN

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

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

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

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

3.13 PRE-PLACEMENT INSPECTION

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

3.14 SURFACE FINISHES

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

3.15 CONCRETE SURFACE TOLERANCES

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

3.16 PUMPING CONCRETE

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

3.17 COMPACTION

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

3.18 FLOOR SLABS TO NZS 3604

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

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Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 24m centres to NZBC B1/AS1, 3.1.13 **NZS 3604 New clause**.

3.19 SAW CUTS TO NZS 3604 OR NZS 4229

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

3.20 SPACING OF SAW CUTS

Spacing of sawcuts

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

3.21 SURFACE DEFECTS

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

3.22 CURING OF CONCRETE

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

3.23 STRIKE FORMWORK

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

12 hours: Sides of beams, walls and columns

3.24 CLEAN OUT

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

3.25 REMOVE

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

4 SELECTIONS

4.1 DAMP-PROOF MEMBRANE

Brand/type: 0.25mm Polythene

4.2 REINFORCEMENT LAPS

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

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

4.3 NORMAL CONCRETE

Normal concrete:
20 MPa: for uninsulated slabs

4.4 SURFACE FINISHES FLOOR SLABS

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

Finish class	Location
U3	Storage

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4.5 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

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

Finish class	Location
Exposed aggregate	entrance pathway

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3155MR MAXRAFT® FLOOR SYSTEM

1 GENERAL

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

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

1.1 RELATED WORK

Refer to 2210 PREPARATION & GROUNDWORK for site preparation.
Refer to 3102 CONCRETE WORK for formwork, concrete and reinforcing.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

EPS	Expanded Polystyrene

Documents

1.3 DOCUMENTS

Documents referred to in this section are:

NZBC B1/VM1	Structure
NZBC B1/AS1	Structure
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4431	Code of practice for earth fill for residential development
AS/NZS 4671	Steel reinforcing materials

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

Manufacturer/supplier contact details

Company:	MBSS Limited
Trading as:	MAXRaft®
Web:	www.maxraft.co.nz
Email:	hello@maxraft.co.nz

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Telephone: 0800 MAXRAFT (629 723)

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years For Pre-coated MAXEdge®

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Quality control and assurance

1.9 STEEL REINFORCING COMPLIANCE

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

1.10 INSPECTIONS

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

1.11 POST-CUT INSPECTION

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

2 PRODUCTS

MAXRaft® Systems

2.1 MAXSLAB®

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

2.2 MAXEDGE®

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

Materials

2.3 BLINDING

25mm compacted GAP 7. Refer to 2242 BACKFILLING.

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2.4 TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to NZS 3631. Refer to MAXRaft® Onsite Guide, and 3102 CONCRETE WORK.

2.5 DAMP-PROOF MEMBRANE

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

2.6 POLYSTYRENE SHEETS - MAXSLAB®

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

2.7 POLYSTYRENE EDGE INSULATION - MAXEDGE®

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

2.8 POLYSTYRENE INTERNAL CONCRETE FOOTING INSULATION

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

2.9 REINFORCEMENT

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

2.10 INTERNAL CORNER REINFORCEMENT

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

2.11 MESH

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

2.12 CONCRETE

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

Components

2.13 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.14 BAR CHAIRS

MAXRaft® proprietary barchairs.

2.15 KAPO BOARD - SLAB EDGE

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

Finish

2.16 PLASTER - SLAB EDGE

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

Installation/application

3.3 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.4 BUILDING PLATFORM

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

3.5 TEMPORARY BUILDING PLATFORM DRAINAGE

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

3.6 HARDFILL

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

3.7 UNDERGROUND SERVICES

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

3.8 BLINDING LAYER

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

3.9 FORMWORK

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

3.10 INSTALL DAMP-PROOF MEMBRANE

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

3.11 PLACE POLYSTYRENE - MAXEDGE®

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

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

3.12 PROTECT - PRE-COATED MAXEDGE®

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

3.13 INSTALL BARCHAIRS

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

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

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

3.14 PLACE REINFORCING STEEL

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

3.15 LAPPED SPLICES

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

3.16 PLACE REINFORCING MESH AND CHAIRS

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

3.17 MESH LAPS

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

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

Do not count bar extensions beyond the outermost cross wire.

3.18 TOPPING SLAB DEPTH

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

3.19 EQUIPOTENTIAL BONDING REINFORCING

If it is a project requirement, ensure that reinforcing is electrically equipotential bonded (or at least conductor cable attached) before the concrete is poured. For bonded reinforcing ensure all reinforcing is interconnected with good contact at joints and tight conductive ties.

3.20 CONCRETE PLACEMENT AND COMPACTION

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

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

3.21 CONCRETE FINISHING

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

3.22 CONCRETE CURING

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

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

3.23 SHRINKAGE CONTROL JOINTS

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

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

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

3.24 PRE-COATED MAXEDGE® - TOUCH UP

Repair imperfections with Pre-coat Touch up.

3.25 PRE-COATED MAXEDGE® - PAINT

Refer to appropriate PAINTING section.

3.26 UNCOATED MAXEDGE® - PLASTER & PAINT

Refer to appropriate plastering and painting sections.

3.27 PAINT UNCOATED KAPO BOARD

Refer to appropriate PAINTING section.

3.28 UNCOATED MAXEDGE® - INSTALL KAPO BOARD

Apply adhesive to fix Kapo Board to MAXEdge®.

3.29 REBATE FINISHING

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

3.30 STRIKE FORMWORK

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

3.31 SURFACE DEFECTS

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

3.32 CLEAN OUT SHRINKAGE CONTROL JOINTS

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

3.33 WATERPROOFING EXTERIOR OPENINGS

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

4 SELECTIONS

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

Materials

4.1 DAMP-PROOF MEMBRANE

Type:	Polythene

4.2 MAXSLAB®

Brand:	MAXSlab®
Overall depth:	350
Slab thickness:	100
Edge:	MAXEdge® - VH EPS insulation
Construction R-value:	R4.01 - determined in accordance with NZBC H1/VM1 Appendix F

4.3 UNCOATED MAXEDGE® - PLASTERED AND PAINTED

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	350

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Finish:	Plaster and then paint. Refer to appropriate PLASTER and PAINTING section.

4.4 UNCOATED MAXEDGE® - WITH KAPO BOARD

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	350
Adhesive	Uroxsys Panel Laminating Adhesive
Finish:	2 coats of acrylic paint to Kapo Board

4.5 PRE-COATED MAXEDGE®

Brand:	MAXEdge®
Polystyrene Type:	VH EPS insulation
Size:	350
Finish:	Paint MAXEdge® with 2 coats of acrylic paint.

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3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES

1 GENERAL

This section relates to the manufacture, supply and erection, of prefabricated:

- MiTek® floor trusses (Posi-STRUT® truss systems)

1.1 RELATED WORK

Refer to 3813NT for general timber framing, bracing, lintels, beams etc.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FTMA	Frame and Truss Manufacturers Association of New Zealand Inc.
SED	Specific Engineering Design

Documents

1.3 DOCUMENTS

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

NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
AS/NZS 1170.0	Structural Design Actions - General principles
AS/NZS 1170.2:2011	Structural Design Actions - Wind actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
MiTek® (GANG-NAIL®) Posi-STRUT® Truss System Manual
MiTek® Structural Fixings On site guide for Building Code Compliance (2012)
For the latest version of the documents refer to the manufacturer's web site.

Manufacturer/supplier contact details

Company:	**MiTek New Zealand Limited**
Web:	www.miteknz.co.nz
Email:	design@miteknz.co.nz
Telephone:	09 274 7109 or 03 348 8691

Requirements

1.5 QUALIFICATIONS

Fabricators to be experienced competent workers, familiar with the materials and the techniques specified.
Fabrication companies to be MiTek® accredited fabricators.

1.6 NO SUBSTITUTIONS

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

1.7 DESIGN CRITERIA NON-SPECIFIC DESIGN

Individual timber framing members used separately, but in association with the trusses, to NZS 3604.

1.8 DESIGN CRITERIA SED

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Frames and trusses to, Alternative Solution MiTek® 20/20 and MiTek Sapphire® Design Programme, NZBC B1/VM1, AS/NZS 1170.0, AS/NZS 1170.2, NZS 1170.5 and NZS 3603.

Documentation for Building Consent/Code Compliance Certificate

1.9 DOCUMENTATION - FABRICATOR / MANUFACTURER

To NZS 3604, 10.2.2.3 **Drawings and Specifications** and the provisions/requirements of the following related clauses.

1.10 PROVISION OF STATEMENTS

Provide the following documentation. The statements shall include the name and position within the company of the person providing the statement.
Fabricator Design and Manufacturing Statements shall be noted as being:

- Issued by a named company, accredited as a fabricator by the nail plate manufacturer
- Issued to the named Owner and available for use by a BCA to assist in determining compliance with the NZBC.

1.11 SHOP DRAWINGS

Provide drawings showing the trusses and their layout;

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

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

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

Site specific structural and loading information including

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

1.12 AS BUILT DOCUMENTS

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

Provide the following as built documents and records:

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

1.13 DESIGN STATEMENT - BUILDABLE TRUSS LAYOUT SERVICE

Roof truss layouts, a truss design statement and a producer statement (design) produced by MiTek Buildable Truss Layout (BTL) service have been included as a part of building consent documentation.

1.14 MANUFACTURING STATEMENT

Provide a statement to support the manufacture of the roof trusses in accordance with the principles of the design statement and truss layouts. This statement is to be issued by a fabricator after manufacture has occurred and identifying:

- The job/design reference name or number
- The site address/location
- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- That the trusses were manufactured in accordance with the Design Statement

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- The name and position within the company of the person providing the statement

Truss identification

1.15 IDENTIFICATION OF TRUSSES ON SITE

A selection of trusses in a job lot manufactured by a fabricator shall carry identification labels or markings fitted during manufacture, to NZS 3604, 10.2.2.5, **Truss identification**.

Identification shall be evident on the bottom chords of main rafter or girder trusses on a minimum of 6 trusses in a job lot, or on every truss where there are less than 6 trusses in the job lot.

Identification text shall be a minimum of 10mm high and shall include:

- The fabricator name
- The nail-plate manufacturer name
- The job/design reference name or number

2 PRODUCTS

Materials

2.1 MITEK TRUSSES - TIMBER

Structural grade timber to NZS 3602, NZBC B2/AS1, gauged, maximum moisture content of 20%, treated to NZS 3640, NZBC B2/AS1, hazard class H1.2 and identified with its unique identifier.

2.2 MITEK FLOOR, RAFTER AND PURLIN TRUSSES

MiTek® (GANG-NAIL®) **Posi-STRUT®** Trusses**,** timber trusses with light gauge metal diagonal webs. Refer to SELECTIONS for type and size.

Accessories

2.3 MITEK POSI-STRUT METAL WEB

MiTek® Posi-STRUT® 0.9mm thick steel, Z275 galvanized to NZS 3604, table 4.2, **Galvanizing of steel components other than nails and screws**, andfolded to form a metal web with integrated nail plates.

2.4 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 COMPLY

Comply with current standards, code requirements and the FTMA CoP in the design and fabrication of trusses and frames.

3.2 DELIVER, HANDLE AND STORE TRUSSES AND FRAMES

Deliver, handle and store frames and trusses so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Follow manufacturer's requirements. Handle all frames and trusses with nylon strops or similar to prevent damage. Store under cover and clear of the ground, to keep dry prior to installation.

Fabrication

3.3 DIMENSIONS, NOT EXPOSED ELEMENTS

Each member calculated length ±3mm. Width and thickness to gauging tolerances. Each overall joint within ±3mm of correct outside profile (including camber allowance).

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3.4 DIMENSIONS, EXPOSED ELEMENTS

Each member calculated length ±1mm width and thickness to gauging tolerances. Each overall joint within ±3mm of correct outside profile (including camber allowance). Joint thickness and width difference between members 1mm maximum. Plate location within half of the manufacturer's tolerances plus a rotation of no more than 1mm in 100mm off reference line.

3.5 FABRICATION

Factory fabricate to the GANG-NAIL® Manufacturing System. Build camber into all elements to accommodate normal deflection under load. Lay up members accurately with all joints tight fitting. Mechanically press plates to manufacturer's tolerances, fully and flat over their whole area into the members forming the joint.

Site installation

3.6 MITEK POSI-STRUT FLOOR TRUSS ERECTION

To MiTek® (GANG-NAIL®) Posi-STRUT® Truss System Manual.
Lift, place and fix trusses without overstressing or deformation. Use temporary supports as needed without causing damage. Fit and fix trusses to wall plates and beams to Posi-STRUT® requirements. Fit and fix, trimming, blocking, nogging, strongbacks, and stability bracing as detailed and to Posi-STRUT® requirements. Ensure all trusses are correctly located, plumb and true to line and face.

Completion

3.7 REPLACE

Replace or repair damaged elements.

3.8 REMOVE

Remove debris, unused materials and elements from the site.

3.9 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

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

4.1 MITEK POSI-STRUT FLOOR TRUSSES

Location:	mid-floor
Brand:	**MiTek® (GANG-NAIL®) Posi-STRUT®**
Floor type/load:	Domestic floor 1.5 kPa
Truss code:	PS30-30-07 or alternative as per fabricator's design
Species/grade:	Radiata pine (gauged) / SG8
Moisture content:	20% maximum
Treatment:	H1.2
Connector finish:	galvanized
Other components:	-
End connectors:	LUMBERLOK® joist hangers

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3813NT NELSONPINE LVL NP FRAME STRUCTURAL FRAMING

1 GENERAL

This section relates to the supply and installation of **NelsonPine® LVL NP Frame** engineered wood products. Structural framing product suitable for residential and light commercial applications
The range includes:

- NP Frame LVL 8
- NP Frame LVL 11
- NP Frame LVL 13

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:

FSC®	Forest Stewardship Council®
LVL	Laminated Veneer Lumber

Documents

1.2 DOCUMENTS

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

NZBC B1	Structure
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in buildings
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 1170.0	Structural design actions - General principles
AS/NZS 1170.1	Structural design actions - Permanent, imposed and other actions
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 4357.0	Structural laminated veneer lumber - Specifications
AS/NZS 4364	Timber - Bond performance of structural adhesive

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

1.3 MANUFACTURER'S DOCUMENTS

Nelson Pine LVL NP Frame documents relating to work in this section are:

- Specific Engineering Design Guide
- Nelson Pine LVL8 H1.2 General Framing
- LVL Framing Technical Data Sheet
- Paint and Stains Systems Brochure
- Nelson Pine LVL NP Frame Framing Solutions
- LVL Product Technical Statement
- Durability Statement
- Carbon Footprint of NZ Laminated Veneer Lumber
- Moisture Meter Correction Figures for Nelson Pine LVL Framing
- Holes and Notches Guide
- Safety Data Sheet (H1.2)
- Nail Laminating/Screwing Double Sections Guide

Manufacturer/supplier contact details

Company:	Nelson Pine Industries Limited
Web:	www.nelsonpine.co.nz
Email:	LVL@nelsonpine.co.nz
Telephone:	0800 800 438 or 03 543 8800

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified NelsonPine® LVL NP Frame engineered wood product, associated components or accessories.

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1.5 QUALIFICATIONS GENERALLY

Refer to the general section 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 CO-ORDINATION

Refer to all drawings to ensure details and fixings required are provided for in the structural Nelson Pine LVL NP Frame work.

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

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

Performance

1.8 DESIGN CRITERIA

NelsonPine® LVL NP Frame product to be designed to comply with NZS 3604, AS/NZS 1170.0, AS/NZS 1170.1, AS/NZS 1170.2, AS/NZS 1170.3, and NZS 1170.5 and NZS 3603. Either to specific design or select using the NP Design software.

1.9 DURABILITY

Timber species and/or treatment selected in accordance with NZBC B2/AS1, NZS 3602, Tables 1, 2 or 3. The adhesive to be Type 1 to AS/NZS 4364, for Service Class 3 conditions (exterior non-protected) to AS/NZS 1328.1, Table A1, Type of adhesive for given service conditions. The adhesive manufacturer's information states that the adhesive can match the durability of the timber up to 50 years

Performance - Wind (design by Consultant)

1.10 DESIGN PARAMETERS WIND - DESIGN BY CONSULTANT

Design the installation to NelsonPine® requirements using NP Design software and design parameters as determined by clause 5.2.1 of NZS 3604.

2 PRODUCTS

Materials - Laminated Veneer Lumber (LVL)

2.1 NELSONPINE® LVL NP FRAME

High stiffness Radiata Pine structural NelsonPine® LVL NP Frame manufactured to AS/NZS 4357.0, engineered wood composite made from rotary peeled veneers, laid up with parallel grain orientation and bonded with an exterior grade structural adhesive.
NelsonPine® LVL NP Frame is an Acceptable Solution as per NZS 3640 for treatment and NZS 3604 Clause 2.3.9 for timber framing.

Components

2.2 JOIST HANGERS

Mild steel galvanized or stainless steel strap , brackets, Tyvek plates and joist hangers to the requirements of NZS 3604, section 4, 'Durability', to suit application and NelsonPine® LVL NP Frame technical documentation.

2.3 STEEL STRAPS

Mild steel galvanized or stainless steel strap , brackets, Tyvek plates and joist hangers to the requirements of NZS 3604, section 4, 'Durability', to suit application and NelsonPine® LVL NP Frame technical documentation.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCT

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

NelsonPine® LVL NP:

- Keep dry during storage and transport.
- Store under a ventilated cover.
- Stack clear of the ground on bearers set at 2m maximum centres.
- Place bearers vertically in line to provide even support.

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.

Application

3.3 ERECTION

Lift, place and fix NelsonPine® LVL NP Frame without over-stressing or deformation. Use temporary supports as needed without causing damage. Fix NelsonPine® LVL NP Frame to NZS 3604 and/or to NelsonPine® LVL NP Frame requirements for specific design. Ensure all members are correctly located, plumb and true to line and face.

3.4 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.

3.5 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 to NZS 3604 or to engineering specific design.

3.6 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, to NZS 3604 or to engineering specific design guide.

3.7 RAFTERS AND OVERHANGS

Refer to NP Design software and /or NZS 3604 for details of rafter tie down, restraint at supports, lateral restraint for rafters, ridge support detail, fascia connection detail and overhang details. For sloping soffit with rafters birds-mouthed at supports, cut notch to provide 45mm minimum bearing. Flange must not overhang support. Do not cut beyond flange.

3.8 BEARING AND SUPPORT DETAILS

Refer to NP Design software and /or NZS 3604 for details of bearing and support, nailing down to supports, installation of joist hangers, web stiffeners, web stiffeners for double joists, for joists oblique to bearer, concentrated loads from jamb studs or posts and limited notching at end supports.

3.9 JOIST HANGERS FOR JOISTS

To NZS 3604.and/or Joist Hanger Specification in NP Design software for specific design.

3.10 LINTEL END CONNECTIONS

Design and installation for lintel end connections and cantilevered lintel connections, trimming stud connections and tie down where required for uplift construction details to NZS 3604 and/or NP Design software for specific design.

Completion & Commissioning

3.11 COMPLETION MATTERS

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

4 SELECTIONS

Substitutions are not permitted to the following NelsonPine® LVL NP Frame product, unless stated otherwise.

4.1 NELSONPINE RADIATA PINE CERTIFIED SUSTAINABLE TIMBER

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Product:	NelsonPine® LVL NP Frame products
Certification type:	FSC
Timber species:	Pinus Radiata
Origin:	New Zealand

Materials

4.2 NP FRAME LVL 8

Location:	internal wall framing and lintels, ridge beam
Size:	90mm x 45mm, 140mm x 45mm, 190mm x 45mm, 240mm x 45mm and 290mm x 45mm
Treatment:	H1.2

4.3 NP FRAME LVL 11

Location:	ridge beam
Size:	290mm x 45mm
Treatment:	H1.2

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3876 STRUCTURAL INSULATED PANEL SYSTEMS (SIPS)

1 GENERAL

This section relates to the supply and fixing of Structural Insulated Panel Systems (SIPS).
It includes wall panels, bracing panels, roof panels and floors.

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:

SIPS	Structural Insulated Panel Systems
OSB	Oriented Strand Board

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	Protection from Fire
NZBC C/AS2	Protection from fire
NZBC C/VM2	Protection from fire
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions

WorkSafe Fact Sheet: Crane Safety for Construction Site Managers/Supervisors
Approved Code of Practice for Cranes

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

NZSIP	Technical Manual, Installation Manual, Project specific Panel Drawings

Manufacturer/supplier contact details

Company:	NZSIP
Web:	https://nzsip.co.nz/
Email:	enquiries@nzsip.co.nz
Telephone:	0800 2 NZSIP

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years	For durability

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

10 years	For workmanship

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

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.6 PREPLANNING

Prior to shop drawing/manufacture of the SIPS panels liaise with the SIPS manufacturer and other relevant parties, to ensure installation/on site requirements are coordinated with the panel production. These should include, but not be limited to;

- construction and erection sequences
- transport and erection processes and equipment required for lifting, handling or stacking
- lifting inserts and other inserts required
- access for cranes and trucks, clearance and obstructions, loads to be applied to the ground or structures by cranes or trucks
- loads to be applied from temporary propping or bracing, suitable foundations or supports for propping and bracing
- temporary loads to be applied from storing or stacking panel elements

1.7 QUALIFICATIONS - FABRICATORS

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

1.8 QUALIFICATIONS - INSTALLERS

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

1.9 NO SUBSTITUTIONS

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

1.10 SHOP DRAWINGS

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

- All panel type details
- Panel layout with a numbered and detailed key
- Base plate details and fixing
- Jointing and fixing (include air leakage prevention)
- Non-panel component details to complete the work
- Services details (trunking, conduits etc)
- Openings and penetration details
- Special lifting requirements

Submit shop drawings for review to designer.

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

Compliance

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's / supplier's warranty
- Installer's / applicator's warranty
- Other information required by the BCA in the Building Consent Approval documents.

Performance - (design by contractor)

1.12 SITE ENVIRONMENT - DURABILITY, WIND, SEISMIC

Design the installation to the manufacturer's requirements and as appropriate for the project site environment parameters stated in the general section 1220 PROJECT.

1.13 SEISMIC, EARTHQUAKE LOADS

Design the system and its anchorages to resist the earthquake loads of the seismic zone in accordance with NZS 1170.5. Refer to SELECTIONS for requirements.

Performance - General

1.14 DURABILITY

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SIPS panel systems to comply with NZBC B2/AS1 Durability for the exposure zone stated in the general section 1220 PROJECT, when installed in accordance with supplier recommendations.

Quality control and assurance

1.15 INSPECTIONS

As required by the Engineer or TA

1.16 NOMINATED MANUFACTURER/SUPPLIER

NZSIP

2 PRODUCTS

Materials - SIPS

2.1 STRUCTURAL INSULATED PANELS - WALL

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation. Panels are cut to the exact shape and size to suit each project.
SIPS wall panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m high.
Typical thicknesses 95mm, 115mm, 165mm. Refer SELECTIONS.

2.2 STRUCTURAL INSULATED PANELS - BRACING

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation with additional fixings or studs added for bracing. Panels are cut to the exact shape and size to suit each project.
SIPS bracing panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m high.
Typical thicknesses 95mm, 115mm, 165mm. Refer SELECTIONS.

2.3 STRUCTURAL INSULATED PANELS - ROOF

Timber framed sandwich panel consisting of two outer skins of 12mm Oriented Strand Board (OSB) with an internal core of insulation. Panels are cut to the exact shape and size to suit each project.
SIPS roof panels are typically 1200mm wide x 2.4m, 2.7m and 3.0m long.
Typical thickness 215mm, 265mm or to suit span. Refer SELECTIONS.

Components

2.4 SPLINE

70mm - 100mm laminated timber studs min. H1.2. Refer SELECTIONS.

2.5 CAM LOCK PANEL JOINT

NZSIP proprietary panel join where a structural spline is not required

2.6 BASE PLATE

Min. H1.2 timber baseplate. Size, shape and fixing to suit panel manufacturers requirements. Refer to shop drawings and SELECTIONS.

Accessories

2.7 SIPS NAILS

Ring shanked nails. Refer to shop drawings for sizes and types.

2.8 SIPS SCREWS

Pancake head screws. Refer to shop drawings for sizes and types.

2.9 HOLD DOWN STRAPS

Proprietary hold down straps. Refer to shop drawings for locations, sizes and types.

2.10 SEALANT

Proprietary sealant and/or foam to suit location and joint design, to manufacturers requirements.

2.11 AIRTIGHTNESS TAPE

Proprietary tape to suit location and joint design, to manufacturers requirements.

3 EXECUTION

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.
Moisture content: 18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements, and shop drawings for specific dimensions and tolerances.

3.5 SETTING OUT

Confirm panel dimensions, set out and site conditions. Also check base plate positions and fixing points.
Confirm that foundations, dead men, and all supports for temporary propping or bracing are up to strength and capable of resisting the applied loads prior to commencing erection of panels.

3.6 TOLERANCES, ON - SITE EXECUTION

Locate SIPS panel items to line and level, and the following tolerances:
Horizontal: ± 3mm maximum, or less if required by manufacturer
Vertical: ± 3mm maximum, or less if required by manufacturer

3.7 FIT BASE PLATE

Fit and fix base plate(s) to manufacturer requirements. Cover with temporary waterproofing until panels are fitted.

3.8 PRE-LIFTING

Prior to lifting any panels from the truck, check and make a record of any damage to the panels, and obtain approval from the Contract Administrator before incorporating a damaged panel into the work.

3.9 LIFTING

Carry out work in accordance with;
WorkSafe Fact Sheet: Crane Safety for Construction Site Managers/Supervisors, and the Approved Code of Practice for Cranes.
Mobile crane positions to be arranged and prepared prior to panel delivery to provide suitable clearances from power lines, trees and any obstructions for all operations including lifting and positioning. Ensure the crane has adequate capacity and is suitable for all aspects of the erection process.
Check that all necessary attachments; strong backs, materials and equipment for rigging, reorienting, propping or bracing and fastening etc, are on site and available prior to delivery of the panels. Where proprietary lifting inserts are being used, ensure that lifting clutches are the correctly sized and from the same supplier.
Heavy panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.

3.10 STACKING ON SITE

Ensure panels are fully supported. Stack to suit order of use.

3.11 PROPPING AND BRACING

Provide temporary adjustable props or braces to secure the panel in position until final support is provided. They must be able to withstand the expected wind loads on the panel for the site and position.

3.12 PLACING AND INSTALLATION

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Install panels in accordance with the drawings, stated design parameters, reviewed and approved construction drawings and installation details. Check order of installation. Co-ordinate with work of other contractors. Consult and coordinate as necessary with installers of adjoining work, including window and door installations.

Order of installation and installation to be to the manufacturers recommendations.
On positioning of the panel, check that all fixings line up with the appropriate items on the preceding work. Also check fixings will function as intended, in particularly fixings required to accommodate seismic movement. Ensure that there is no damage caused to the panel, surrounding surfaces or fixings during placing. Seal joints with sealant or foam to manufacturers requirements.

3.13 FINAL POSITION

Adjust panels into final position, check alignment, verticality, joint widths etc and fix into place.

3.14 POST PLACING ADJUSTMENTS

After permanent placing check and adjust as necessary;

- all fixings for correct alignment and operation.
- recheck that all props, braces and fastenings are secure and capable of performing as required - not less than 1 day and not more than 7 days after a panel is fixed into position and held by temporary means.
- if panels are subject to, high wind loads, unintended or accidental loads during construction, recheck props braces and fastenings.

3.15 TEMPORARY PROTECT EXPOSED TOPS OF PANELS

During installation use temporary waterproofing to protect tops of panels, plates and sills etc, until they are covered or protected by subsequent construction.

3.16 TAPE JOINTS

Tape joints with airtight tape to manufacturer requirements.

3.17 PENETRATIONS

Form additional penetrations to suit SIPS details.

4 SELECTIONS

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

Performance

4.1 LIVE LOAD

Deflection: refer to Engineer's calculations

4.2 SEISMIC, EARTHQUAKE LOADS

Seismic zone: 3

4.3 VERTICAL MOVEMENT

Movement:
SLS refer to Engineer's calculations
ULS refer to Engineer's calculations

4.4 DESIGN WIND PRESSURES, BY CALCULATION

The design wind pressures are to AS/NZS 1170.2.

	SLS	ULS
	refer to Engineer's calculations	refer to Engineer's calculations

Panels

4.5 PANEL SCHEDULE

Refer to Manufacturers Panel Schedule.

4.6 SIPS WALL PANELS

Panel I.D.	Panel type	Height (mm)	Width (mm)	Thickness (mm)	R Rating	BU's	

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All	NZSIP	varies	up to 1200mm	165	6	varies	

4.7 SIPS ROOF PANELS

Panel I.D.	Panel type	Height (mm)	Width (mm)	Thickness (mm)	R Rating	BU's	
All	NZSIP	varies	up to 1200mm	215	8	-	

Components

4.8 SPLINE

Splice I.D:	as required
Type/Brand:	LVL8
Size:	140 x 90

4.9 CAM LOCK JOIN

Spline I.D:	as per Shop Drawings
Type/Brand:	NZSIP proprietary cam lock fixings

Accessories

4.10 SIPS NAILS

Location:	as required - refer NZSIP Technical & Installation documentation
Type/Brand:	ring shank
Size:	50 x 2.8mm

4.11 SIPS SCREWS

Location:	as required - refer NZSIP Technical & Installation documentation
Type/Brand:	Spax
Size:	varies

4.12 METAL STRAPS AND BRACKETS

Location:	as required - refer NZSIP Technical & Installation documentation
Type/Brand:	Lumberlok or Pryda
Size:	varies

4.13 SEALANT AND FOAM

Location:	as required - refer NZSIP Technical & Installation documentation
Type/Brand:	as provided by NZSIP

4.14 AIRTIGHT TAPE

Location:	panel joints, corners and abutments with other external envelope components
Type/Brand:	ProClima

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4161PC PRO CLIMA WALL AND ROOF UNDERLAYS, TAPES & ACCESSORIES

1 GENERAL

This section relates to the application of **Pro Clima NZ Limited** external wall and roof underlays, internal floor protection membranes, 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:

NZMRM	New Zealand Metal Roofing Manufacturers Association Inc.
MVTR	Moisture vapour transmission resistance
TEEE	Thermoplastic Elastomer-Ether Ester
SIPs	Structural Insulated Panels

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 B2/AS1	Durability
NZBC C/AS2	Protection from fire
NZBC E2/AS1	External moisture
NZBC F2/AS1	Hazardous building materials
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays - part 1: materials
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

CodeMark™GM-CM30032 SOLITEX EXTASANA Wall protection membrane

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Pro Clima documents relating to work in this section are:
SOLITEX EXTASANA® Installation Guide
SOLITEX EXTASANA ADHERO® Mass Timber Application Guide
SOLITEX EXTASANA ADHERO® Mass Timber Moisture Protection
SOLITEX MENTO® Roof Underlay Installation Guide
BRANZ Appraisal 815 (2024) - TESCON EXTOSEAL Sill Tape
BRANZ Appraisal 838 (2024)- TESCON EXTORA Sealing Tape
BRANZ Appraisal 855 (2019)- SOLITEX MENTO 3000 Roofing Underlay - Amendment 1
BRANZ Appraisal 876 (2020) - SOLITEX MENTO 1000 Roofing Underlay
BRANZ Appraisal 953 (2024) - KAFLEX and ROFLEX Grommets
BRANZ Appraisal 989 (2023) - SOLITEX EXTASANA ADHERO® Self-adhesive Underlay - Amendment 1
BRANZ Appraisal 1163 (2021) - SOLITEX EXTASANA® Wall Underlay
SOLITEX MENTO 1000 connect Roof Underlay Installation Guide
SOLITEX MENTO 3000 connect Roof Underlay Installation Guide
SOLITEX UM connect Application Instructions

Manufacturer/supplier contact details

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Company: **Pro Clima NZ Limited**
Web: www.proclima.co.nz
Email: welcome@proclima.co.nz
Telephone: 0800 pro clima (776 254)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years For Pro Clima system

- Provide this warranty on the Pro Clima standard form.
- Commence the warranty from the date of purchase of the product from the manufacturer.

Refer to the Pro Clima warranty agreement and the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer warranty:
2 years: For installation

- Provide this warranty on the installer/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 NO SUBSTITUTIONS

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

1.7 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Installers to be experienced in the installation of Pro Clima products and familiar with Pro Clima NZ Limited technical literature and the related documents listed in this design i.e. NZMRM CoP. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

2 PRODUCTS

Wall underlays

2.1 WALL PROTECTION MEMBRANE - MECHANICAL FIX

SOLITEX EXTASANA® wall underlay to NZS 2295, comprised of a non-porous, UV stable, water resistant TEEE film, laminated between two layers of non-woven spun-bonded polypropylene, coloured blue on the top surface and grey on the bottom. Watertight to >10,000mm water column pressure, with low MVTR (vapour open).
Has a flammability Index of ≤ 5, when tested to AS 1530.2 and meets the requirements of NZBC C/AS2, 4.17.8. (b) for suspended flexible fabrics, NZBC B2 Performance B2, 3.1(a), 3.1(b), 3.2, NZBC E2 Performance E2, 3.2 and NZBC F2 Performance F2, 3.1 in accordance with CodeMark™ Certificate GM-CM30032. Refer to BRANZ Appraisal 1163 for details. Supplied in rolls 1.5m x 36.5m long (55m²) and 2.74m wide x 36.5m long (100m²).
SOLITEX EXTASANA® must be covered and protected against weather or ultraviolet light within 180 days.

Roofing underlays

2.2
ROOF UNDERLAY - LIGHT WEIGHT, TYPE R4, HIGH EXPOSURE (30 DAYS), SELF-ADHESION STRIP

SOLITEX MENTO® 1000 connect, consists of a waterproof, non-porous diffusion open membrane laminated to two layers of polypropylene fleece and adhesive strips on either side of sheet. Has a flammability Index of ≤ 5, when tested to AS 1530.2. Refer to BRANZ Appraisal 876 for details. Supplied in rolls 1.5m and 3m wide x 50m long. Self-supporting to 1200mm.

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SOLITEX MENTO® 1000 connect, must be covered and protected against weather or ultraviolet light within 30 days.

Components

2.3 WINDOW AND DOOR WEATHERTIGHT CONNECTION STRIP

CONTEGA® EXO exterior window and door connection tape for SOLITEX EXTASANA® wall underlay comprised of PP microfibre fleeces, used for weathertight connection to window and door frames to the wall underlay or other weathertightness layer. Supplied in rolls 85mm and 120mm wide x 30m long for different framing widths.

2.4 MULTI-PURPOSE ADHESIVE

ORCON® Classic multi-purpose adhesive, for bonding Pro Clima membranes to rough adjoining structural components or mineral surfaces. Supplied in a 310ml cartridge or 600ml sausage.

2.5 SILL TAPE

TESCON EXTOSEAL® Sill Tape, a butyl rubber, pressure-sensitive, self-adhering, one-piece stretchable, self-sealing, non-bitumen sill tape with a siliconized release backing paper. Workable in cold temperatures, down to - 20°C. Does not melt in the heat and can be applied to damp surfaces. Complies with NZBC E2/AS1, 9.1.5(b) Wall underlays to wall openings. Refer to BRANZ Appraisal 815 for details. Supplied in rolls 150mm, 200mm or 300mm wide x 20m long. TESCON EXTOSEAL® can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.6 WEATHERTIGHT JOINERY SEALING TAPE

TESCON EXTORA® PROFIL weathertight joinery sealing tape, UV stable, pressure-sensitive, self-adhering tape comprised of a PP fleece protection layer, solid acrylic glue and a split, siliconized release backing paper. Applied to perimeter of joinery extrusion and joined to wall underlay. Supplied in rolls 60mm wide x 30m long.
Note: Tescon Extora® PROFIL can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.7 NAIL & SCREW SEALING TAPE

TESCON® NAIDECK double-sided butyl rubber self-sealing tape, water resistant, reinforced, non-bitumen, used on the underside of a purlin / batten on roofs and behind façade clip and mounts on walls, to form a seal around nail or screw penetrations. Supplied in rolls 50mm wide x 20m long.

2.8 DOUBLE-SIDED TAPE

DUPLEX Double-sided tape comprised of siliconized release paper, used for bonding the overlaps of roof underlay SOLITEX MENTO® membranes and fixing of membranes to steel frame structures. Supplied in rolls 25mm wide x 80m long.

Accessories

2.9 SEALING GROMMETS FOR ROUND CABLES - SINGLE AND DOUBLE, 5-12MM DIAMETER

KAFLEX mono/duo sealing grommets 145mm x 145mm, manufactured from special reinforced paper with EPDM. Single and double models for cables of diameter 4.8 - 12mm.
Suitable for sealing penetrations through roof and wall underlays. KAFLEX grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.10 SEALING GROMMET - FOR PIPES, 15-30mm DIAMETER

ROFLEX 20 self-adhesive sealing grommet for pipes manufactured from PP fleece, solid acrylic glue and EPDM rubber, 140mm x 140mm in size. Sealing grommet for pipes of diameter 15mm-30mm.
Suitable for sealing penetrations through roof and wall underlays, for indoor and outdoor applications. ROLEX 20 grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

2.11 SEALING GROMMET - FOR PIPES, 30 - 320mm DIAMETER

ROFLEX 30/50/100/150/200/250/300 self-adhesive sealing grommet for pipes manufactured from PP fleece, solid acrylic glue and EPDM rubber, vary in size from 140mm x 140mm to 500mm x 500mm. Sealing grommet for pipes of diameter 30-50mm, 50-90mm, 100-120mm, 120-170mm, 170-220mm, 220-270mm and 270-320mm.
Suitable for sealing penetrations through roof and wall underlays, for indoor and outdoor applications. ROLEX 30/50/100/150/200/250/300 grommets can be exposed to weather or ultraviolet light for a period of up to 180 days.

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2.12 SAFETY MESH

Safety mesh**,** 2mm x 150 x 300mm galvanized or PVC coated safety mesh to AS/NZS 4389.

2.13 GUTTER AND UNDER FLASHINGS

SOLITEX MENTO® range roof underlay to NZS 2295, cut to width for use under valley, apron flashing and internal gutters.

2.14 CAVITY CLOSERS, EAVES FLASHINGS, RIDGE VENT FLASHINGS

Fix cavity closers, eaves and ridge vent flashings and finishing accessories to complete the Pro Clima Roof Ventilation system in accordance with SOLITEX MENTO® Roof Underlay Installation Guide and to Pro Clima Construction details.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 GENERAL REQUIREMENTS

Design application and installation of Pro Clima NZ Limited products to NZBC E2/AS1, BRANZ Appraisals, Pro Clima Technical Literature and Industry Codes of Practice.

3.4 INSPECTION

Before starting work, check that the building construction phase will allow work of the required standard. Carry out remedial work identified before laying underlay.

Preparation

3.5 PREPARATION

Before starting work, ensure all surfaces are stable, dry, smooth, and free from dust, dirt, silicone and grease. Remove all unwanted material from the surface with a vacuum cleaner or cloth if necessary. Remove flaking and loose materials such as peeling paintwork, building papers and labels. Adhesion to frozen surfaces not possible, if in doubt carry out adhesion tests.

Application - wall underlay

3.6 SCOPE LIMITATIONS - WALL PROTECTION MEMBRANE OVER RIGID WALL UNDERLAYS

SOLITEX EXTASANA® Wall Protection Membrane is to be used as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope limitations:

- The scope limitations of NZBC E2/AS1, 1.1, with regards to building height and floor plan area.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer to NZBC E2/AS1.
- Situated in NZS 3604 Wind Zones up to and including Extra High.

3.7 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of generic DPC as a separator between timber and metal cladding.

Application - roofing underlay

3.8 SAFETY MESH

Lay safety mesh over exposed roof areas fixed in accordance with AS/NZS 4389 and NZMRM CoP.

3.9 SCOPE LIMITATIONS - OVER ROOFS OF SIP AND CLT CONSTRUCTION

SOLITEX EXTASANA ADHERO® Self-Adhesive Underlay is to be used over plywood and OSB roof sarking on timber and steel framed buildings within the following scope:

- The scope limitations of NZBC E2/AS1, 1.1 regarding building height and floor plan area.

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- used on buildings constructed from Structural Insulated Panels (SIPs) or
- used on buildings constructed from Cross Laminated Timber (CLT) and
- With roof claddings in accordance with NZBC E2/AS1, 8.1-8.4
- Situated in NZS 3604 Wind Zones up to and including Extra High.

3.10 SCOPE LIMITATIONS - SPECIFIC DESIGN ROOFS

SOLITEX EXTASANA ADHERO® Self-Adhesive Underlay may be used over roof sarking on buildings subject to specific weathertightness design.

3.11 FIX ROOF UNDERLAY - PRO CLIMA METHOD WITH SELF-ADHESION STRIP

Fix roof underlay in accordance with SOLITEX MENTO® 3000 connect Roof Underlay Installation Guide and as follows. Applicable when the underlay is separated from the roofing to provide additional ventilation to the roof space:

- Fix roof underlay at maximum 150mm centres to all framing with large-head clouts 20mm long, 8mm-12mm stainless steel staples, self-drilling screws or proprietary underlay fixings.
- Fix roof underlay horizontally and fix direct to the top of the rafter or truss top chord and secure with minimum 20mm x 45mm counter batten fixed directly over the rafter or truss member. Increase the length of fixings used to secure purlins and tile battens to the rafter or truss by the depth of the counter batten.
- All laps to be a minimum of 150mm. Seal laps with self-adhesion strips provided on either side of sheet.
- For pitches less than 10° Pro Clima recommend that the underlay is laid on solid sarking.

3.12 GUTTER AND UNDER FLASHINGS

Install SOLITEX MENTO® range roof underlay for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix SOLITEX MENTO® range soffit liner from top plate down 150mm past ribbon plate.

Application - tape systems

3.13 APPLY TESCON TAPE SYSTEMS

Apply TESCON tape systems in accordance with Pro Clima TESCON Installation Guides.
Note: Tapes can be specified for all joins in SOLITEX membranes to prevent wind-wash of insulation and resulting degradation of insulation performance.

Application - grommet and detail solutions

3.14 INSTALL GROMMETS AND DETAIL SOLUTIONS

Install grommets and detail solutions in accordance with Pro Clima KAFLEX and ROFLEX Installation Guides.

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to www.proclima.co.nz.
Substitutions are not permitted to the following.

Materials

4.1 PRO CLIMA SOLITEX EXTASANA® MEMBRANE - MECHANICAL FIX

Location:	all external walls
Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX EXTASANA® Wall Protection Membrane
Sealing tape:	TESCON EXTORA® weathertight sealing tape TESCON EXTOSEAL® sill tape CONTEGA® EXO window and door connection strip
Adhesive:	ORCON® Classic multi-purpose adhesive
Accessories:	KAFLEX mono/duo sealing grommets for cables ∅ 6-12mm ROFLEX 20 sealing grommet for pipes and conduit ∅ 15-30mm

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4.2

PRO CLIMA SOLITEX MENTO 1000 CONNECT ROOF UNDERLAY, WITH SELF-ADHESION STRIP

Location:	all roofs
Manufacturer:	Pro Clima NZ Limited
Type:	SOLITEX MENTO® 1000 connect three layer underlay
Sealing tape:	TESCON EXTORA® weathertight sealing tape TESCON® NAIDECK nail sealing tape
Accessories:	ROFLEX 20 sealing grommet for pipes and conduit ∅ 15-30mm ROFLEX 30 / 50 / 100 / 150 / 200 / 250 / 300 sealing grommets for pipes ∅ 30-320mm

Accessories

4.3 ROOF SARKING / SUBSTRATE

Location:	roofs over thermal envelope spaces and eaves	/	roofs over unconditioned
Brand:	NZSIP Strandboard skin	/	12mm STrandboard to match

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4221BV TIMBERLINE THERMORY VERTICAL CLADDING

1 GENERAL

This section relates to the supply and installation of **Timberline** Thermory vertical cladding.
It includes:

- Thermory Nordic Pine vertical cladding profiles
- Fascias
- Mouldings / trims
- Cavity wall battens
- Associated fixings/flashings to complete installation

1.1 RELATED WORK

Refer to 4161PC for wall underlays
Refer to 3876 for wall framing

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

COC	Chain of Custody
FSC®	Forest Stewardship Council®

Documents

1.3 DOCUMENTS

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

NZBC B2	Durability
NZBC C/AS1-AS2	Protection from fire
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
BRANZ BU 411	Recommended timber cladding profiles
EN 84	Wood preservatives - accelerated aging of treated wood prior to biological testing - leaching procedures
BS EN 113	Wood preservatives. Teat methods for determining the protective effectiveness against wood destroying basidiomycetes. Determination of toxic values.
EN 15083-1	Durability of wood & wood based products - determination of the natural durability of solid wood against wood destroying fungi test methods - Part 1 Basidiomycetes
NASH Building Envelope Solution	2016 Light Steel Framed Buildings
NASH N-11	House Insulation Guide
NASH Standard Part 2	May 2019 Light Steel Framed Buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Test Report - CATAS Durability Testing to EN 15083-1 Thermory Ash & Nordic Pine
Test Report - EPH, Rot Resistance -Thermory Ash
Test Report - Tallinn University of Technology, Brinell Hardness Testing -Thermory Ash
Test Report - Tallinn University of Technology, Dimensional change - Thermory Ash
Thermory Brochure
Thermory Pine Cladding Data Sheet

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Manufacturer/supplier contact details

Company:	Timberline (a Division of BuildPro Group)
Web:	www.timberline.co.nz / www.buildpro.net
Email:	enquires@timberline.co.nz or joe.lagan@timberline.co.nz
Telephone:	0508337446 or 021 276 2456 (Joe Lagan)

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Thermory Weatherboards

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

Performance

1.8 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To NZBC E2/AS1 External moisture.

1.9 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604.

1.10 SPREAD OF FIRE FOR CLADDING

To NZBC C/AS1, 5.3 External cladding systems, NZBC C/AS2, 5.8 External cladding Systems or NZBC C/VM2.

Compliance information

1.11 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's / supplier's warranty
- Producer Statement - PS3 Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

2 PRODUCTS

2.1 TIMBER SPECIES - THERMORY NORDIC PINE

Timberline Thermory® Nordic Pine is a thermally modified Scots Pine, soft wood (pinus sylvestris) sourced from Northern Europe with FSC and PEFC certification. Has a light golden brown colour. Durability tested to EN 15083-1 with a durability of Class 2 to BS EN113. Refer to SELECTIONS for weatherboard cladding profiles.

2.2 THERMORY - WEATHERBOARD PROFILE

Thermory weatherboard profiles (unless detailed otherwise) to NZS 3617 or BRANZ BU 411. Weatherboards in lengths relevant to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position. Refer to SELECTIONS for details.

Acceptable Solution is limited to the following types of weatherboards and their derivatives:

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- Vertical Standard Shiplap
- Vertical Standard Board and Batten

2.3 THERMORY - COVER BOARDS & MOULDINGS

Thermory profiles (unless detailed otherwise) to NZS 3617 with all unsound and open split knots excluded by cross cut removal prior to fixing into position. Profiles in lengths relevant to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position. Refer to SELECTIONS for details.

Materials - Cavity battens

2.4 CASTELLATED CAVITY BATTENS - STRUCTURALLY FIXED

Radiata pine, H3.2 castellated and bevelled cavity batten, minimum 45mm thickness. Structurally fix horizontally to manufacturer's requirements with the bevelled edge at the top sloping down to the outside. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

Components

2.5 UNDERLAYS

Refer to 4161PC section

2.6 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, aluminium or stainless steel trays with upstands. Upstand one side 10mm and the other 75mm. Length and width to suit cavity. To NZBC E2/AS1: clause 9.1.8.3 and figure 66. Closure strip, punched with 3mm-5mm holes or slots to provide a minimum ventilation opening area of 1000mm² per lineal metre of wall. Length to suit cavity. To NZBC E2/AS1: clause 9.1.8.3 and figure 66.

2.7 NAILS, STAINLESS STEEL

Crown, Rose or Flat Head, Annular Grooved stainless steel Grade 316 fixings to NZBC E2/AS1 Table 24.
NOTE: Select appropriate nail size / length to achieve a minimum of 35mm embedment into the framing.

2.8 CLINCH NAILS, STAINLESS STEEL

50mm / 40mm x 2.0mm Clinch Nail, annular grooved shank grade 316 stainless steel.

2.9 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0 **Flashings** and to NZBC E2/AS1, 9.1.10 **Windows and Doors**. Material, grade and colour as detailed and scheduled and to NZBC E2/AS1; Table 21: **Compatibility of materials in contact** and Table 22: **Compatibility of materials subject to run-off**.

Ensure that materials used for head, jamb and sill flashings are compatible with the cladding system, fixings and window frame materials.

Finishes

2.10 UV PROTECTIVE COATING

Refer to relevant PAINTING section for details

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Store inside out of sun, rain & other elements. Where this is not possible, boards require to be stack uniformly, off ground and covered with a waterproof tarp. Leave tarp ends open so moisture is not trapped.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

For timber framing, do not start fixing until 90% of the values obtained are within the range in NZS 3602 table 4, **Allowable moisture content (%) at time of installation or in the case of framing timber at time of enclosure.**

For Thermory profiles, do not install if the moisture is above specified moisture content in selections. Immediately before starting fixing, test the moisture content of the boards. Use an electrical moisture meter to test 5% of boards, but not less than 10 boards in the centre of the length.

3.4 SUBSTRATE - TIMBER

Before starting fixing ensure that the substrate conforms with NZS 3604, section 2, table 2.1, **Timber framing tolerances** and the requirements of NZS 3604, section 6, **Foundation and subfloor framing** and NZBC E2/AS1, governing support for timber board cladding.

Application - preparation/general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 FIX UNDERLAYS

Refer to 4161PC section

3.7 INSTALL DRAINED CAVITY -STRUCTURALLY FIXED TO TIMBER FRAMING

Install 45mm minimum thickness castellated and bevelled cavity battens to NZBC E2/AS1: 9.0 **Wall claddings,** where required. The castellated battens are fixed horizontally with the bevelled edge at the top sloping down to the outside. The battens are permanently fixed using selected stainless steel screws or nails as per the fixings tables in the NZSIP Technical Manual.

3.8 CAVITY CLOSER/VERMIN-PROOFING

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). Use cavity spacers where fixing is required between cavity battens.

3.9 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)

3.10 SET-OUT

Using laser or mechanical devices set-out the overlap boards to ensure dimension to exposed face in line of weather is constant and that boards remain vertical. For vertical shiplap boards, where possible the exposed lap should face away from the prevailing wind.

Use a string line to set out all nailing that will be visible in the finished work. Align all nailing accurately in straight lines and consistent, accurate placement relative to visible edge of board.

Application - fixing

3.11 FIXING - CLEAR FINISH

Install level, true to line and face, to NZBC E2/AS1: 9.4 **Timber weatherboards**. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Finish the heads of selected fixing nails flush onto and not into the board surface. Do not over drive the nail head and crush the timber surface beneath and surrounding the nail.

3.12 FIXING -SCARF JOINS (WITHIN-BOARD JOINS)

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Scarf joins (within-board joins) to occur over battens, random stagger within-board / scarf joints across adjacent boards. Orientate scarf joints to face away from prevailing winds and weather. Do not place adjacent to another scarf joint, junction, corner or penetration. Maximum of one scarf join permitted in any length of weatherboard. Cut board at min 30° angle. Use appropriate adhesive to bond boards together and nail overlapping board only.

3.13 FIXING - VERTICAL SHIPLAP WEATHERBOARDS

Ensure weatherboards are set-out to achieve correct overlaps and provide a 2mm expansion gap between lapped boards. Single face fix weatherboards to every fixing point, just clear of the adjacent lapped board. Use full length boards where possible. Nails to be driven in an upward angle of 10°. Nails to achieve a minimum 35mm embedment into the framing. Line nails horizontally across the boards.

Using a 40mm or 50mm x 2.0mm clinch nail, prior to the next row of Vertical Shiplap boards being fixed alongside (structural cavity battens at maximum 480mm centres) and at a position hard up against but not into the hidden lap board edge at every fixing point, restrain the hidden lap tongue by driving the clinch nail into the frame so that the clinch head settles flush into the weatherboard's surface. The clinch nail head must not sit proud of the timber surface nor prevent the correct separation of each adjacent row of boards.

Refer to details for board joints, inter-storey junctions external and internal corner construction details.

3.14 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to NZBC E2/AS1. Ensure minimum flashing cover to weatherboards is maintained depending on corner option selected.

Material compatibility to NZBC E2/AS1, table 21, **Compatibility of materials in contact** and table 22, **Compatibility of materials in run-off**.

3.15 FINISHING - UV COAT

If specified, apply UV coating in accordance with manufacturer's instructions. Refer to relevant painting section for details

Completion & Commissioning

3.16 COMPLETION MATTERS

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.
Refer to 1270 CONSTRUCTION for completion requirements.

4 SELECTIONS

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

4.1 TIMBERLINE THERMORY NORDIC PINE CERTIFIED SUSTAINABLE TIMBER

Product:	Timberline Thermory Horizontal Cladding products
Certification type:	FSC
Timber species:	Pinus Sylvestris (Nordic Pine)
Origin:	Estonia

Weatherboards and trims

4.2 SHIPLAP WEATHERBOARDS - THERMORY NORDIC PINE

Location:	as per plan
Type/Brand:	Thermory Nordic Pine - Shiplap Vertical Cladding
Grade:	Natur (Sound Tight Knot Grade)
Surface finish:	Dressed
Profile / size:	140mm x 26mm
Fixing system:	drained cavity
Moisture content:	4-6% at fixing

4.3 TRIMS - THERMORY NORDIC PINE

Location:	as required

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Type/Brand:	Thermory Nordic Pine - Trims
Grade:	Natur (Sound Tight Knot Grade)
Surface finish:	Dressed
External corner:	45 x 45 corner mould
Internal corner	butt join
Other trims:	joinery jamb trims
Moisture content:	4-6% at fixing

Accessories

4.4 CAVITY BATTENS - STRUCTURALLY FIXED

Location:	all external walls
Type/Brand:	Castellated and bevelled radiata cavity batten
Treatment:	H3.2
Size:	45mm wide x 45mm thick
Fixings:	8g x 65mm csk stainless steel screws

4.5 CAVITY CLOSER / VERMIN PROOFNG

Type:	Vermin closure to NZBC E2/AS1 9.1.8.3 Vermin-proofing
Brand:	any
Material:	uPVC

4.6 INTERNAL AND EXTERNAL CORNER BACK FLASHINGS

Type/Size:	as per plan
Material:	Dynex uPVC

4.7 WEATHERBOARD FIXINGS - STAINLESS STEEL NAILS

Nails:	Crown head
Type:	Grade 316 Stainless Steel
Size:	60 x 2.18mm

4.8 WEATHERBOARD FIXINGS - CLINCH NAILS

Nails:	Clinch Nails
Type:	Grade 316 Stainless Steel
Size:	40 x 2.0mm

Finishes

4.9 UV PROTECTIVE COATING

Refer to relevant PAINTING section for details

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4222WH ITI TIMSPEC WEATHERTEX HORIZONTAL WEATHERBOARD

1 GENERAL

This section relates to the supply and fixing of ITI Timspec Ltd Weathertex, horizontal weatherboard cladding systems either direct fixed or over a drained cavity.

It includes:

- Weathertex Selflok or Primelok weatherboards.
- All associated cavity battens, flashings, accessories and fixings to complete installation.

1.1 RELATED WORK

Refer to 4161PC for wall underlays.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

FSC®	Forest Stewardship Council®
NASH	National Association of Steel Framed Housing
PEFC	Programme for the Endorsement of Forest Certification Schemes

1.3 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC C/AS1	Protection from Fire
NZBC C/AS2	Protection from Fire
NZBC E2/AS1	External Moisture
AS/NZS 1859.4	Reconstituted wood-based panels-specification - wet process fibreboard
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 4266	Reconstituted wood-based panels - methods of test
BRANZ BU 673	Cavity battens
NASH Building Envelope Solutions	2019 Light Steel Framed Buildings
NASH N-11	House Insulation Guide
NASH Standard Part 2	May 2019 Light Steel Framed Buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
BRANZ Appraisal 511 (2023) Weathertex Direct Fixed Weatherboard Cladding Systems
BRANZ Appraisal 512 (2023) Weathertex Cavity Fixed Weatherboard Cladding Systems
Weathertex New Zealand Installation Manual
Weathertex Construction Detail Guide - Primelok Weatherboards
Weathertex Construction Detail Guide - Selflok Weatherboards

Manufacturer/supplier contact details:

Company:	ITI Timspec Limited
Web:	www.ititimspec.nz
Email:	sales@ititimspec.co.nz
Telephone:	09 620 0260 Auckland
	03 384 5287 Christchurch

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
25 years

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	For Weathertex Selflok and Primelok weatherboards, factory primed and associated components and accessories.
15 years	For Weathertex Selflok weatherboards, natural finish and associated components and accessories.

- Provide this warranty on the Weathertex Warranty & Maintenance, New Zealand form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT).
- Commence the warranty from the date of purchase.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 COMPLIANCE - WEATHERTEX CAVITY FIXED WEATHERBOARDS

To meet the requirements of BRANZ Appraisal 512 Weathertex Cavity Fixed Weatherboard Cladding Systems:

- Risk Score to E2/AS1, no greater than 20.
- Wind zone to NZS 3604, up to and including Extra High.
- Installation cavity fixed to timber & steel framed buildings, installed horizontally on vertical surfaces in accordance with Weathertex New Zealand Installation Guide.

Performance

1.9 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To NZBC B2/AS1 Durability and NZBC E2/AS1 External moisture.

1.10 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design installation and select fixings to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.11 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

To NZBC C/AS1, 5.3 External cladding systems or NZBC C/AS2, 5.8 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 WEATHERTEX SELFLOK WEATHERBOARDS

Weathertex Selflok weatherboards comply with AS/NZS 1859.4 for exterior hardboard and tested to AS/NZS 4266. Manufactured from exterior grade, selected Australian hardwood fibres that are pre-treated with steam then bonded together using natural lignins present in the fibres, along with a waterproofing agent.

Weathertex Selflok weatherboards are 300mm wide x 9.5mm thick x 3660mm long planks either pre-primed or natural finish. Planks are profiled with an interlocking lap joint on the top & bottom edges and are available in various profiles and textures. Refer to SELECTIONS for details.

2.2 COVER BOARDS, MOULDINGS AND SCRIBERS

To ITI Timspec CertClad® profiles as detailed, with species and grading to NZS 3602, but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.3 FASCIA BOARDS

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To ITI Timspec CertClad® profiles, with species and grading to NZS 3602, but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.4 WALL UNDERLAYS

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

2.5 CAVITY BATTENS - TIMBER STRUCTURAL

To BRANZ BU 673, part 6. H3.2 SG6 Radiata pine kiln dried battens, 45mm thick, 40mm 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.

Components

2.6 NAILS, GALVANIZED - FOR TIMBER FRAMING

For Weathertex pre-primed weatherboards with concealed or semi-concealed fixing, use specified hot dip galvanized nails in accordance with Fastening Tables in Weathertex New Zealand Installation Guide for climatic zones B, C & D in accordance with NZS 3604. Refer to SELECTIONS.

2.7 NAILS , STAINLESS STEEL - FOR TIMBER FRAMING

For Weathertex Selflok, pre-primed weatherboards with exposed traditional fix fastenings and for Weathertex Selflok, natural finish weatherboards use specified Grade 304 stainless steel nails for climatic zones B & C or Grade 316 stainless steel nails for Sea Spray Zone & climatic zone D in accordance with NZS 3604. Nail fastenings in accordance with Fastening Tables in Weathertex New Zealand Installation Guide. Refer to SELECTIONS.

2.8 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Weathertex Large Cavity Closer, folded colour coated steel profile to meet NZBC E2/AS1, clause 9.1.8.3 Vermin Proofing, for use in conjunction all Weathertex weatherboards. Available in 1830mm lengths.

For Primlok weatherboards, can substitute Weathertex Large Cavity Closer & Weathertex Starter Strip for a folded colour coated steel cavity closer strip 29mm wide, to requirements of NZBC E2/AS1, clause 9.1.8.3 Vermin Proofing and figure 66. Available in 3000mm lengths.

2.9 WEATHERTEX JOINTERS

Weathertex jointers manufactured from polycarbonate to suit profile for use in conjunction all Weathertex weatherboards except for Selflok Natural (unprimed) weatherboards.

2.10 TRIMTEC ALUMINIUM JOINTERS - FOR SELFLOK WEATHERBOARDS

Trimtec anodised aluminium joiner for use in conjunction with Selflok weatherboard profiles only, supplied in 3660mm lengths.

2.11 TRIMTEC INTERNAL / EXTERNAL CORNER / STOP END TRIMS

Trimtec stop end, internal / external corners and associated corner plugs manufactured from anodised aluminium for use in conjunction all Weathertex weatherboards, supplied in 3660mm lengths.

2.12 FLASHINGS

To NZBC E2/AS1, 4.0 Flashings. Material, grade and colour as detailed and scheduled and to NZBC E2/AS1, Table 21 Compatibility of materials in contact and Table 22 Compatibility of materials subject to run-off. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

2.13 BACK FLASHINGS - FOR BUTT & MITRE JOINTS

100mm wide 100mm wide Ultra violet (UV) and corrosion resistant back flashing for use in conjunction with butt and mitre joints to Selflok Natural finish weatherboards.

Accessories

2.14 SEALANT

Flexible sealant complying with NZBC E2/AS1 or NASH Building Envelope Solutions or sealant covered by a BRANZ Appraisal suitable for use as a weather sealing sealant for exterior use.

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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.

All boards to be inspected and any board showing damage, should not be installed.

3.2 ROUTINE MATTERS

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 SUBSTRATE - TIMBER FRAMING

Before starting fixing ensure that the substrate conforms with NZS 3604, section 2, table 2.1, Timber framing tolerances and the requirements of NZS 3604, section 6, Foundation and subfloor framing and NZBC E2/AS1, governing support for timber board cladding. Refer to Weathertex New Zealand Installation Guide for project specific wind loading requirements for wall stud centres, ensure studs are at maximum 600mm centres (maximum 450mm centres for Primlok Weatherboards in some wind zone classifications).

For timber framing, do not start fixing until framing moisture content is in accordance with:

Moisture content:	24% maximum at time of cladding application 18% maximum before the Weathergroove panels are completed

Application - preparation / general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 FIX UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section. Ensure all underlays have been installed in accordance with manufacturer's instructions and are in accordance with NZBC E2/AS1, Table 23 Properties of roof underlays & wall underlays.

3.7 DRAINED CAVITY / STRUCTURAL

Fit and fix 45mm cavity battens over wall underlay. Permanently fix battens onto the framing fixings as per the NZSIP Technical Manual fixing tables, staggered 12mm either side of the batten centreline. Make allowances for cladding control joints where required.

3.8 CAVITY CLOSER/VERMIN-PROOFING

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). Use cavity spacers where fixing is required between cavity battens.

3.9 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.
- all penetrations to be flashed in accordance to NZBC E2/AS1 prior to cladding installation.
- claddings neatly finished off to all sides of openings, where required install Trimtec stop end to suit weatherboard profile.

Application - Weathertex Horizontal Weatherboards

3.10 INSTALLATION GENERALLY

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Installation of Weathertex weatherboards shall be in accordance to the Weathertex New Zealand Installation manual and BRANZ Appraisal 511 for Weathertex Direct Fixed Weatherboard Cladding Systems and BRANZ Appraisal 512 for Weathertex Cavity Fixed Weatherboard Cladding Systems.

3.11 GROUND CLEARANCE - SEAL BOTTOM EDGE & BACK FACE

Ensure Weathertex weatherboards overhang bottom plate on a concrete slab by minimum 50mm. Ensure the bottom edge of Weathertex weatherboards are minimum 100mm clear of paved surfaces and 175mm clear above unprotected ground.

For pre-primed panels apply a liberal coat of solvent based undercoat to the bottom drip edges and extend undercoat 100mm up the back face of weatherboard.

3.12 REPRIME EDGES & SCREW HOLES - FOR PRE-PRIMED PANELS

Reprime all cut edges of Weathertex pre-primed weatherboards with solvent based undercoat. It is advisable to pre-paint a top coat at board ends adjacent to plank joiners to avoid white lines either side of the accessory after product contraction in dry conditions.

If using countersunk screw fixings for pre-primed weatherboards, allow to prime screw holes after screwing. Once holes are filled, the filler should be sanded and area re-primed prior to painting.

3.13 FIX TRIMTEC ACCESSORIES

Fix selected Trimtec Aluminium corner and stop end accessories prior to the installation of the Weathertex weatherboards. It is recommended that expansion gaps be used for wall lengths greater than 6m to allow for thermal expansion / contraction of aluminium trims.

3.14 INSTALLATION SET-UP

Set a horizontal datum around the perimeter of the building. Row heights should be checked as work progresses to avoid creep.

Application - Weathertex Selflok Weatherboards

3.15 FIXING - SELFLOK WEATHERBOARDS

Install level, true to line and face. Commence at wall base, first row to over-hang bottom plate by 50mm, fasten 70mm up from the bottom edge of weatherboard at each stud, a second row of fasteners shall be placed at each stud according to either traditional or semi-concealed fixing pattern as selected. For successive rows of weatherboards rest the rebated edge of Selflok edge on the row below, apply firm pressure to ensure interlocking prior to fastening at each stud according to either traditional or semi-concealed fixing pattern as selected.

Nail fastenings must finish flush with the board surface and not be punched and filled. Screw fastenings may be driven 2mm below the board surface and filled with a suitable flexible timber filler.

3.16 TRADITIONAL JOINER - SELFLOK PRE-PRIMED WEATHERBOARDS

Form joints midway between studs and stagger randomly throughout the wall. Between each stud, joints with a joint shall have a continuous plank above and below, so joiners may only align every second row. Use Weathertex traditional jointer to suit profile / finish of selected weatherboard, fit joiner to an installed plank. Joiners provide a tight fit to the board, if required a hand plain may be used to skim the back corner of the joining edge.

3.17 TRIMTEC LONG VERTICAL JOINER - SELFLOK PRE-PRIMED / NATURAL WEATHERBOARDS

Align weatherboard joins to form a single vertical off-stud joint using the Trimtec Long Vertical Joiner. Joiners must be supported by noggings at 800mm centres or alternatively positioned over a double stud.

Attach the Trimtec Long Vertical Joiner to the framing at maximum 800mm centres using flat head nails. Weather boards may be slightly bowed to allow installation between two vertical joiners or slid in place from the top.

Finishing

3.18 INSTALL FLASHINGS

Install flashings as detailed on the drawings or Weathertex New Zealand Installation Guide and to NZBC E2/AS1. Ensure minimum flashing cover to weatherboards is maintained.

3.19 PAINTING PRE-PRIMED WEATHERBOARDS

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Ensure Weathertex pre-primed weatherboards are painted with 60 days of installation. Refer to relevant painting section for details.

Completion & Commissioning

3.20 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to www.ititimspec.nz.

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

Materials

4.1 WEATHERTEX SELFLOK - HORIZONTAL WEATHERBOARDS, PRE-PRIMED

Location:	as per plans
Type/Brand:	Weathertex Selflok
Profile/texture:	Ecogroove150mm / Smooth
Surface finish	Factory primed
Dimensions:	300mm x 3660mm x 9.5mm thick
Lap:	20mm
Installation:	cavity fixed
External corner:	Trimtec external Box corner - small, anodised aluminium
Internal corner:	Trimtec internal 'W' corner - small, anodised aluminium
Joiner:	Trimtec Long Vertical Aluminium Joiner, anodised aluminium

Components

4.2 NAIL FIXINGS - FOR SELFLOK WEATHERBOARD TO TIMBER FRAMING

Location:	as per plan
Framing:	NZSIPs / structural cavity battens
Fixing type:	ND50 Bradnail 14g, Stainless steel, Grade 304 Climatic Zone B&C / finished flush with board surface
Fixing pattern:	Traditional fix or semi-concealed

Accessories

4.3 CAVITY BATTENS - TIMBER STRUCTURAL

Location:	all external wals
Type/size:	Radiata Pine min H3.2 min 45x45mm
Note:	Refer to timber framing specification for details and fixing

4.4 CAVITY CLOSER/VERMIN-PROOFING

Location:	At the base of wall system when using cavity battens
Type/size:	Weathertex Large Cavity Closer / 20mm deep

4.5 SEALANT

Type/brand:	Sikaflex AT Facade

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4239JH JAMES HARDIE® SOFFITS

1 GENERAL

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

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

Documents

1.1 ABBREVIATIONS AND DEFINITIONS

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

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Eaves and Soffits Installation Manual by James Hardie® (Feb 2025)
Fire and Acoustic Design Manual by James Hardie® (Nov 2022)
James Hardie® Eclipsa™ Eaves Lining Product Technical Statement
James Hardie® Hardie™ Groove Lining Product Technical Statement
James Hardie® Villaboard™ Lining Product Technical Statement
James Hardie® Eaves and Soffit Care and Maintenance

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For lining product and accessories

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

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Refer to the general section 1239 OPERATION & MAINTENANCE for provision of the following general operation and maintenance information as electronic PDF format documents:
James Hardie® Eaves and Soffit Care and Maintenance

Performance

1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

2 PRODUCTS

Materials

2.1 HARDIE™ FLEX EAVES LINING

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

Components

2.2 FASTENER TYPE

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

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

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

Components - Hardie™ Flex Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIE™ FLEX NAILS

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

2.5 INSEAL TAPE

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

2.6 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

Components - General

2.7 FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 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 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.
Moisture content timber framing: 18% maximum

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Application - general

3.5 SHEET LAYOUT

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

3.6 CUTTING SOFFIT CLADDING

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

3.7 CIRCULAR HOLE FORMING

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

3.8 IRREGULAR HOLE FORMING

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

3.9 INSTALL HARDIE™ FLEX EAVES LINING

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

3.10 BUTT JOINT

Paint sheet edges prior to installation.

3.11 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.12 FASTENER - SIZE AND LAYOUT

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

3.13 SEALANTS

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

3.14 PAINTING

Refer to painting section/s for protective coating system.

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 HARDIE™ FLEX EAVES LINING

Location:	All eaves & gable overhangs
Brand/type:	James Hardie® Hardie™ Flex Eaves Lining
Thickness:	4.5mm & ^mm as appropriate to overall dimensions
Width:	varies
Fixing Method:	Hardie™ Flex Nails

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Fixing type:	Galvanized Hardie™ Flex Nail, 40 x 2.8mm
Joint detail:	Soffit 4.5mm PVC 2-way Jointer (for negative detail) for 4.5mm thick sheet. Hardie™ Jointer 6mm for 6mm thick sheet.

Painting

4.2 PAINTING

Refer to painting section/s for details.

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4311NZ COLORSTEEL® ROOFING

1 GENERAL

This section relates to **New Zealand Steel Limited** coated metal steel in a range of colours and grades for roofing material.

1.1 RELATED WORK

Refer to 4161PC for underlays, foils and DPC.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
CoP	Code of Practice for Metal Roofing
MS	Modified silicone

Documents

1.3 DOCUMENTS

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

NZBC E2/AS1	External Moisture
NZBC C/VM2	Protection from fire
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
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)
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

- COLORSTEEL® Installers Guide
- COLORSTEEL® Design Guide
- COLORSTEEL® Matte Design Guide
- New Zealand steel - Zincalume® Brochure
- COLORSTEEL® - Environmental Categories & Warranty Guide

Manufacturer/supplier contact details

Company:	New Zealand Steel Limited
Web:	www.colorsteel.co.nz
Email:	specifications@colorsteel.co.nz
Telephone:	0800 100523
Rollformer:	owner/roofer selection

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For COLORSTEEL® Maxam for perforation
15 years	For COLORSTEEL® Maxam for paint

Include a copy of the roofing manufacturers maintenance requirements with the warranty.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	For workmanship

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS - DRIDEX®

Workers to be trained and accredited by New Zealand Steel Limited in the installation of COLORSTEEL Dridex® roofing materials. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.9 NO SUBSTITUTIONS

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

1.10 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

Performance - Fire

1.11 INTERIOR SURFACE FIRE PROPERTIES - GROUP NUMBER

Zincalume®, COLORSTEEL® Maxam™, COLORSTEEL Altimate® and COLORSTEEL® Maxam™ Dridex® have been tested to ISO 5660.1 & ISO 5660.2 and have been assigned the following Group Numbers in accordance with Appendix A, NZBC C/VM2:

Zincalume®	Group Number 1-S
COLORSTEEL® Maxam™	Group Number 1-S
COLORSTEEL® Maxam™ Dridex®	Group Number 1-S
COLORSTEEL Altimate®	Group Number 1-S

2 PRODUCTS

Materials

2.1 COLORSTEEL® MAXAM™ - STEEL, TYPE AM COATING (ALUMINIUM/ZINC/MAGNESIUM ALLOY), PREPAINTED

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397, AM150 grade. Pre-finished /pre-painted to AS/NZS 2728 to a Type 6 standard.

Fixings

2.2 FASTENERS GENERALLY

Fixings and fasteners are to be compatible with all materials and have a durability no less than the material being fastened.

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2.3 FIXING SCREWS

Screws to AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by roofing profile manufacturer (roll-formers) fixing charts or Specific Engineered Design, and with a minimum Class 4 durability and not less than the material being fixed. Screw lengths must be sufficient to allow 30mm penetration into structural timber or 3 threads penetration through steel structural members. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.4 RIVETS

Sealed aluminium, minimum diameter 4.0mm.

Components

2.5 FLASHINGS GENERALLY

To E2/AS1, 4.0, Flashings.
Formable grade 0.55mm BMT for steel and 0.90mm for aluminium coated to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.6 BOOT FLASHINGS

EPDM proprietary boot flashing designed to weatherproof cylindrical penetrations.

Accessories

2.7 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161PC.

2.8 SEALANT

Neutral Curing silicone or MS polymer sealant as required by the roofing manufacturer and used as directed.

2.9 PROFILE CLOSURES

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

2.10 LAP SEALING TAPE

Closed cell self-adhesive nitrile tape.

3 EXECUTION

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
Store on a level firm base with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets.

Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage. Use soft, flat sole shoes when fixing and for all other work on the roof.

Do not use sunscreen containing Zinc Oxide or Titanium Dioxide as it may damage the paint coating in contact.

3.2 ROUTINE MATTERS

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.

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could adversely affect the roofing. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile or cladding to the primary structure.

Ensure moisture content is:
Timber framing: 18% maximum

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12-16% maximum under traverse flashings

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

3.4 WORK SAFE

All installation to be conducted in accordance with WorkSafe Working at Heights recommendations and any site requirements

3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by fitting separator strips of compatible inert materials. Prevent wet contact between metals and treated timber and cement based materials.

Application

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof.

Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).

3.8 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

3.9 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencils for marking aluminium/zinc coated products. Make all cuts cleanly to a marked straight line, cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.10 FIX SHEETS

Fix sheets in place using the fastening system required by the roofing profile manufacturer (roll-former) for specified profiles, to suit project wind loadings stated in the general section 1220 PROJECT or in accordance with specific design in accordance with project engineers requirements. Use only screws as required by manufacturer. Paint colour matched fixings and accessories before installation. Use setting tools that do not unduly damage the head of the fasteners.

3.11 THERMAL MOVEMENT

Fixing and jointing to conform with the roofing manufacturer's requirements for thermal movement for selected profile.

3.12 END LAPS

End laps in roofing sheets are not permitted, except where specifically detailed.

3.13 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of all sheets. Form downturns at the gutter line where the roof pitch is less than 8 degrees using purpose made tools.

3.14 INSTALL FLASHINGS

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Flash roof, including to parapets, walls and penetrations to detail. Transverse flashings to be installed on timber framing with a maximum moisture content of 18%. Where no detail is provided flash to NZMRM CoP recommendations and the roofing manufacturer's and NZBC E2/AS1 requirements. Cut accurately and fix using sealant and rivets to detail to form a weatherproof cover. For highly visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.15 FLASHING PENETRATIONS

Flash all penetrations through the roof according to design details. Fit pipe flashings with a proprietary collar flashing to manufacturer's requirements, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

3.16 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing to manufacturer's requirements.

3.17 FLASHING TERMINATION

Terminate all visible flashing ends to provide a tidy and weathertight finish.

3.18 USE OF SEALANTS

Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces. Secure joint with rivets at 50mm centres.

Completion

3.19 COMPLETION MATTERS

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

3.20 PROTECT

Protect the completed roof area from mechanical and chemical damage. Provide temporary protection, as required, for material storage, foot traffic and later works such as scaffolding and remove when no longer required.

4 SELECTIONS

For further details on selections go to www.colorsteel.co.nz and to selected roofing manufacturer's website.
Substitutions are not permitted to the following, unless stated otherwise.

Material - Roofing

4.1 COLORSTEEL® MAXAM™ PROFILED ROOFING

Location:	All roofs
Manufacturer:	New Zealand Steel
Material:	COLORSTEEL® Maxam™
BMT:	0.55mm
Colour:	Tidal Drift
Profile:	Corrugate
Substrate:	timber framing
Fixing:	screw fixing to manufacturer's specifications

Accessories

4.2 FLASHINGS - GENERALLY

Profile:	various
BMT/material:	0.55 / COLORSTEEL® Maxam™
Coating system:	To match roofing
Coating colour:	To match roofing

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5111H JAMES HARDIE® FIBRE CEMENT SHEET LININGS

1 GENERAL

This section relates to the supply and installation of **James Hardie®** Villaboard™ Lining and Hardie™ Groove Lining for:

- internal wall linings
- ceiling linings

1.1 RELATED WORK

Refer to 5113G for plasterboard linings.

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 2589	Gypsum linings - Application and finishing
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:
Villaboard™ Lining
Hardie™ Groove Lining

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® Villaboard™ Lining, Hardie™ Groove Lining (refer to James Hardie® product warranty)
15 years:	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 COMPLIANCE

Fibre cement sheets to AS/NZS 2908.2.

2 PRODUCTS

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Materials

2.1 PLAIN FIBRE CEMENT SHEET LININGS

James Hardie® Villaboard™ Lining manufactured from treated cellulose fibre, portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2. Sealed on the face.

Components

2.2 BATTENS, TIMBER

Minimum 45mm wide, 35mm deep timber with depth suitable for length of fasteners used.

2.3 PACKERS

3 - 4mm timber packers.

2.4 NAILS

6mm and 9mm linings:	40mm x 2.8mm galvanized flathead Hardie™ Flex nails
Over Gypsum plasterboard:	50mm x 2.8mm galvanized flathead Hardie™ Flex nails

2.5 SCREWS FOR POWER SCREW GUN DRIVING

Timber framing

6mm and 9mm linings:	Villadrive 6 gauge x 30mm self embedding screws or Hardie™ Drive self embedding stainless steel screws
Steel framing:	Steel 8 gauge x 32mm self embedding screws

2.6 WALL BOARD ADHESIVE

Polyurethane wallboard adhesive. Refer to James Hardie® product installation manual.

Accessories

2.7 CONTROL JOINTS SECTION

45mm x 10mm shaped PVC control joint or Rondo P35 jointer.

2.8 EXTERNAL CORNER SECTIONS

30mm x 30mm x 1.2mm PVC angle.

2.9 POLYETHYLENE TAPE

Self adhesive polyethylene for behind expressed joints and expressed control joints.

2.10 JOINT REINFORCING TAPE

52mm wide perforated paper tape.

2.11 BEDDING COMPOUND

Hardie™ Base Coat compound powder.

2.12 FINISHING COMPOUND

Hardie™ Top Coat premixed.

2.13 SEALANT

Silicone or polyurethane sealant. Refer to the James Hardie® installation manual.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

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3.3 MOISTURE CONTENT

Maximum moisture content of timber framing to NZS 3602.

3.4 PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation.

3.5 BUILDING

Ensure building is weatherproof before lining work commences.

3.6 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.

3.7 HANDLING

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

3.8 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment. Maximum moisture content of timber framing to NZS 3602.

Application

3.9 FIXING WITH BUTT JOINTS

Cut sheet using the appropriate method for the specified finish. Prepare and fix square edged sheets in accordance with James Hardie Installation Manual. Include flexible sealant in wet areas.
Joint width: 1 - 2mm

3.10 PROVIDE VERTICAL CONTROL JOINTS

Provide vertical control joints at 7.2 metre centres maximum for general application and 4.2 metres centres maximum for tiled applications. Provide acoustic sealant in walls having an acoustic rating.

3.11 PROVIDE HORIZONTAL CONTROL JOINTS

Provide horizontal control joints at 7.2 metres centres maximum for general application and 4.2 metre centres maximum for tiled applications.

3.12 PROVIDE EXTERNAL CORNER ANGLE

Provide perforated PVC external corner angle or paper faced rigid spine corner mould to external corners.

3.13 INTERNAL CORNERS

When used in tiling applications provide a Lumberlock Stud saver to framed internal corner prior to fixing of Villaboard™ Lining.
Provide perforated PVC corner mould, or paper faced rigid spine corner mould or solid blocking to internal corners.

3.14 FORMING HOLES

Required holes accurately formed and cut to James Hardie® requirements.

3.15 SILICONE JOINTS

Provide polyethylene tape behind joints finished with flexible sealant.

Levels of Finish

Refer to AS/NZS 2589.
Refer to SELECTIONS/drawings for required levels of finish.

3.16 LEVEL 0, 1 and 2 FINISHES

Refer to James Hardie® installation manual.

3.17 LEVEL 3 FINISH

Application:

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For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes or where heavy paper wall coverings are to be applied as the final decoration.

Jointing/setting: Joints and corner joints will be set with Hardie™ Base Coat reinforced with perforated paper tape and Hardie™ Top Coat.

Finish: This level of finish must be sufficiently smooth to accept vinyl, tiles or textured coatings without blemishes.

3.18 LEVEL 4 FINISH

Application: This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.

Jointing/setting: Refer to flush jointing recommendations on page 11 James Hardie® Villaboard™ Lining installation manual.

Finish: For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level or wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.

3.19 LEVEL 5 FINISH

Application: This level of finish is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheet paints.

Jointing/setting: Typically all joints and corner joints will have tape embedded in Hardie™ Base Coat applied over all joints, angles, fastener heads and accessories. A thin skim coat of Hardie™ Top Coat must be applied to the entire surface to be plastered. The surface must be finished smooth and free of tool marks and ridges and special care must be taken with the application of the finishing compound to achieve a smooth, true surface suitable for these critical finishes.

Finish: This level of finish is for use where gloss, semi-gloss, low-sheen or non-textured paints are specified or where critical lighting conditions occur.

Completion & Commissioning

3.20 COMPLETION MATTERS

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

4 SELECTIONS

Linings

4.1 JAMES HARDIE® VILLABOARD™ LINING

Location: Tiled areas to bathrooms
Type: James Hardie® Villaboard™ Lining
Thickness: 9mm
Fixing method: Screw

4.2 HARDIE™ GROOVE LINING

Location: as wainscoating to selected spaces (confirm with owner)
Fasteners: Villadrive 6 gauge x 30mm self embedding screw

4.3 LEVELS OF FINISH

To conform to the following levels of finish:

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Location	Finish level
Varies	to be agreed with owner

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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
- bracing systems
- wet area systems
- GIBFix® Framing 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/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
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)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section:
GIB® Site Guide (April 2024)
GIB® Wet Area Systems (February 2021)
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems

Manufacturer/supplier contact details

Company:	Winstone Wallboards
Web:	www.gib.co.nz
Telephone:	0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

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1.5 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 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.

Performance

1.7 BRACING REQUIREMENTS

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

- GIB Ezybrace® Systems and/or GIB Ezybrace® Bracing Design Software
- GIB Ezybrace® Bracing Supplement Document

Refer to drawings for location and type.

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

Components

2.2 GIBFIX® ANGLES

GIBFix® Angles, 45mm x 45mm angles, 2.4m or 2.7m long.

2.3 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

Refer to GIB® requirements for appropriate details.

2.4 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims
GIB® UltraFlex® high impact corner mould
GIB® Levelline® Tape on Trim

2.5 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS

GIB® Rondo® P35 control joints.
GIB® Goldline™ tape-on trims
GIB® plastic W-profile control joints.

Accessories

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2.7 ADHESIVE

Timber frame and/or steel frame:
GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.8 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

2.9 JOINTING TAPE

GIB® jointing tape.

2.10 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 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 PRE-INSTALLATION REQUIREMENTS - TIMBER FRAMING

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

Framing substrates shall be in accordance to AS/NZS 2589, GIB® Site Guide and GIB X-Block® Radiation Shielding Systems literature.

Check timber framing moisture content is in accordance with requirements of AS/NZS 2589. Refer to NZBC E2/AS1 and GIB® Site Guide.

Timber framing:	18% maximum for fixing plasterboard to timber (8-12% recommended for fixing plasterboard to timber framing if air conditioning and/or central heating are to be installed)

If GIB EzyBrace® systems are used in conjunction with GIBFix® Framing System, ensure that the positioning of the GIB HandiBrac® panel hold-down brackets are to the manufacturers recommended placements for the GIBFix® Framing System.

3.5 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.

"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.

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3.6 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.

Application

3.7 INSTALL GIBFIX® ANGLES

Install GIBFix® Angles to the wall and ceiling junctions to the GIBFix® Framing System requirements. Install GIBFix® Angles before installation of GIB® plasterboard linings.
Run GIBFix® Angles as continuous lengths between framing members. If joints are necessary for the GIBFix® Angles, overlap the angles by a minimum of 300mm and fix as per manufacturers requirements. When jointing GIBFix® Angles, locate the shorter section at the top of the stud.

3.8 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide. 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 BOARD INSTALLATION FOR GIBFIX® SYSTEM

Fix the GIB® plasterboard to the GIBFix® Angle side over the stud first and then fix the GIB® plasterboard to the GIBFix® Angle only side (not over the stud). If the GIBFix® Angle only side must be fastened off first, provide additional fixings for the GIBFix® Angle to the stud, to the manufacturers requirements.

3.11 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.12 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems

3.13 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.14 INSTALL TAPE-ON TRIMS

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

Finishing

3.15 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion & Commissioning

3.16 COMPLETION MATTERS

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

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As per plans	GIB® Standard plasterboard	10mm	

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location		Thickness	Finish Level

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	Plasterboard type / Lining requirements		
Bathrooms, kitche, laundry	GIB Aqualine® plasterboard	10mm	

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Ceilings generally	GIB® Standard plasterboard	13mm	

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Wet area ceilings	GIB Aqualine® plasterboard	13mm	

4.5 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems

For bracing element location refer to drawn documentation.

Accessories

4.6 GIBFIX® FRAMING SYSTEM COMPONENTS

Brand/type: GIBFix® Angles
Fixings: GIB® Grabber® Dual Head Screws

4.7 GIB® TAPE ON EDGE OR CORNER TRIMS

Brand/type: stopper's selection

4.8 GIB® EDGE PROFILES

Brand/type: stopper's selection

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5431S STRANDFLOOR TIMBER FLOORS BY LAMINEX

1 GENERAL

This section relates to the supply and fixing of Laminex® New Zealand Strandfloor® flooring in interior applications.
It includes:

- Strandfloor Tongue & Groove

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:

FSC	Forest Stewardship Council
pMDI	Polymeric methyl diphenyl diisocyanate
VOC	Volatile organic compounds

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 C/VM2	Protection from fire
AS/NZS 1860.1	Particleboard flooring - Specification
NZS 3604	Timber-framed buildings
NASH Standard Part 2	May 2019 Light Steel Framed Buildings
CodeMark BRANZ-CM-1003 (2022)	Strandfloor Flooring
CodeMark BRANZ-CM-1004 (2022)	StrandfloorH3.1 Flooring

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Strandfloor Technical Manual, Edition 5 (March 2019)
Strandfloor Product Warranty
Strandfloor Strandboard Fire Test Report
Strandfloor and Strandboard Safety Data Sheet
StrandfloorH3.1 and Strandsarking Safety Data Sheet
Strandfloor VOC Certificate
Strandfloor Formaldehyde Emissions Report
BRANZ Appraisal 676 (2016) - Strandfloor Flooring
BRANZ Appraisal 677 (2016) - StrandfloorH3.1 Flooring

Manufacturer/supplier contact details

Company:	Fletcher Building Ltd
Trading as:	Laminex New Zealand
Web:	www.laminex.co.nz
Email:	info@laminex.co.nz
Telephone:	0800 303 606

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

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

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Compliance information

1.6 CODEMARK CERTIFICATE

Strandfloor / StrandfloorH3.1 timber floors meet the requirements of the NZBC when used within the conditions and limitations of certificate BRANZ-CM-1003 / BRANZ-CM-1004.

Performance - fire

1.7 SURFACE FIRE PERFORMANCE - UNFINISHED FLOORING

Unfinished Laminex Strandfloor / StrandfloorH3.1 has a critical radiant flux 2.2kW/m2 as defined by NZBC C/VM2 Appendix B, Table B1 and in accordance with performance requirements of NZBC C/AS2, 4.17.3 and Table 4.5 Critical Radiant Flux Requirements for Flooring.

Performance - bracing

1.8 BRACING REQUIREMENTS

Floor diaphragms on timber joists as part of a structural bracing system to meet the requirements of NZS 3604, Section 5 Bracing Design. Floor diaphragms on steel joists as part of a structural bracing system to meet the requirements of NASH Standard Part 2, Section 5 Bracing.

2 PRODUCTS

Materials

2.1 LAMINEX STRANDFLOOR TONGUE AND GROOVE FLOORING

Strandfloor Tongue and Groove 20mm thick high density wood-based sheet flooring to AS/NZS 1860.1. Manufactured from pMDI resin bonded reconstituted wood strands. Sheets contain a wax emulsion for additional moisture resistance. Available in 2400mm x 1200mm and 3600mm x 1200mm sheets with 4.5mm wide x 9.5mm deep groove to one long edge and rigid polypropylene tongue to the opposite long edge. FSC-COC and PEFC-COC certified. Refer to SELECTIONS.

Components

2.2 MECHANICAL FIXING

Refer to SELECTIONS.

2.3 ADHESIVE

Elastomeric construction adhesive or polyurethane paste adhesive. Refer to SELECTIONS.

Accessories

2.4 WOOD FILLER

Wood dough type filler, tinted to match.

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 WEATHER EXPOSURE

Laminex Strandfloor flooring not to be exposed to weather for more than 8 weeks.
Laminex StrandfloorH3.1 flooring not to be exposed to weather for more than 12 weeks.

3.4 PRE-INSTALLATION REQUIREMENTS

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

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Moisture content: 18% maximum for timber floor structure
Moisture content: 15% maximum for timber substrate flooring
Moisture content: 70% maximum relative humidity at concrete surface

Installation/application general

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 LAYING PATTERN

Lay flooring sheets printed face down and closely butted in a staggered layout with an 8mm sheet edge clearance to fixed objects including columns and bottom plates.

3.7 SUPPORT SHEET EDGES AND JOINTS - TONGUE & GROOVE

Fully support short edges and joints. No support is required to long edges (i.e. tongue and groove joints).

Application adhesive

3.8 APPLY ADHESIVE TO JOISTS

Prior to laying flooring sheets, apply adhesive in 5mm beads to top of floor joists and nogs

3.9 APPLY ADHESIVE TO SHEET EDGES

Following fixing of flooring sheets, apply adhesive in 5mm beads to the sheet edge adjacent to the next sheet laid.

3.10 APPLY ADHESIVE TO SHEET GROOVES

Prior to inserting tongues into grooves, apply adhesive in 2mm beads to grooves.

Installation/application - Laminex Strandfloor Tongue & Groove - timber/steel joist floors

3.11 INSTALL FIRST ROW TONGUE & GROOVE FLOORING

Place each sheet of first row over adhesive with long edge spanning across at least 3 joists and sheet edges centred over joists. Mechanically fix along boundary joist long edge only.

3.12 INSTALL ADDITIONAL ROWS TONGUE & GROOVE FLOORING

Install second row sheets repeating the process for first row and driving tongue into groove using a timber block and heavy hammer as per manufacturer's instructions. With second row laid down, first row can be fully fixed. Install additional rows repeating the process for first and second row.

3.13 SCREW FIXING - TONGUE & GROOVE

Screw fix at maximum 150mm centres around sheet perimeter with 15mm clearance to tongue and groove sheet edge and 10mm clearance to short sheet edge. Screw fix at maximum 200mm centres along intermediate supports. Finish screws flush with sheet surface.

Surface preparation for floor finishes

3.14 PREPARE SURFACE FOR FINISHES

For floor coverings: tighten fixings, punch nails/tighten screws prior to sanding.

Carpet:	Single cut with a drum or belt sander:	60 - 100 grit
Sheet vinyl:	Single cut with a drum or belt sander:	60 - 100 grit

Installation of vinyl floor covering requires the application of a flexible or sheet underlayment. Refer to vinyl manufacturer technical installation data.

For clear finishes: tighten fixings, punch nails/tighten screws, and fill nail holes with wood filler prior to sanding.

Clear coating:	1st cut with a drum sander:	40 - 80 grit
	2nd cut with a disc sander:	100 grit
	3rd cut with disc sander:	120 - 150 grit

Follow coating manufacturers' instructions.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 LAMINEX STRANDFLOOR TONGUE & GROOVE WOOD FLOORING

Location:	First floor excluding ensuite
Supplier:	Laminex New Zealand
Brand:	Strandfloor Tongue & Groove
Sheet thickness:	20mm
Sheet size:	3600mm x 1200mm

Fixings

4.2 FIXINGS TO TIMBER JOIST FLOOR

Adhesive:	Sika Nailbond Premium
Mechanical fixing:	Galvanized or Stainless steel, 45mm x8g self-drilling screws

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5438H JAMES HARDIE® FIBRE CEMENT SECURA™ FLOORING

1 GENERAL

This section relates to the supply and installation of **James Hardie®** Secura™ Flooring substrate for:

- interior wet and dry area applications
- over timber or lightweight steel floor joists.

1.1 RELATED WORK

Refer to tiling section for tiling.
Refer to waterproofing section for waterproofing.

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, C/AS2	Protection from fire
NZBC E3/AS1	Internal moisture
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in buildings
CodeMark™ CMNZ30181 verA	Secura™ Flooring

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
James Hardie® Secura™ Flooring Installation Manual (Feb 2025)
BRANZ Appraisal 850 (2025) - Secura™ Flooring

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:

25 years:	For James Hardie® Secura™ Flooring.
15 years:	For accessories supplied by James Hardie®
From:	Date of purchase

- Provide this warranty on the manufacturer's standard form.
- Refer to James Hardie® product warranty for details

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any James Hardie® 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 COMPLIANCE

Fibre cement sheets to AS/NZS 2908.2.

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2 PRODUCTS

Materials

2.1 FIBRE CEMENT SHEET FLOORING

Secura™ Flooring, lightweight fibre cement sheet, measuring 2400mm x 600mm x 19mm thick, manufactured from treated cellulose fibre, Portland cement, ground sand, water and proprietary additives to AS/NZS 2908.2. Tongue and groove jointing system and pre-sealed with a water resistant sealer.

Accessories - not supplied by James Hardie®

2.2 NAILS FOR TIMBER

50mm x 2.87mm Dekfast RounDrive, hot dipped galvanized nails or 50mm x 2.87mm RounDrive, Stainless steel ring shank nails.

2.3 SCREWS FOR TIMBER

10g x 40mm self-embedding stainless steel wood screws for use under waterproofing membranes.

2.4 BACKING ROD

PEF backing rod to be used with sealant in control joints.

2.5 SEALANT

James Hardie® approved and BRANZ appraised sealant used in v joint for tiled applications. Ensure compatibility with waterproofing membrane system selected.

2.6 WATERPROOFING MEMBRANE

James Hardie® approved waterproofing membrane over the Secura™ Flooring in wet areas. Refer to waterproofing section.

2.7 ADHESIVE

Adhesive used over joists prior to installation of Secura™ Flooring. Refer to adhesive manufacturers technical data and James Hardie technical specifications. Refer to adhesive section.

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 MOISTURE CONTENT

Maximum moisture content of timber framing to NZS 3602.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment.

Application

3.5 SUPPORT FRAMING

Ensure support framing is completed to James Hardie® stated requirements, with joists at maximum 400mm centres.

3.6 SUPPORT EDGES AND JOINTS

Fully support edges and joints of sheets, other than tongue and groove joints.

3.7 FIXINGS

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Minimum 50mm from a corner, 25mm from the tongue and groove edge, 12mm from the square edge, 200mm maximum centres along edges and on intermediate supports. Leave heads flush with surface.

3.8 FIXING SHEETS - TILE APPLICATIONS

Fix Secura™ Flooring sheets to James Hardie® requirements. Lay sheets in a staggered layout, long edge of sheet at right-angles to support and with sheets in square, true alignment and plane. Install sheet with label 'This side up for tiles' facing down. Provide a 2mm gap at square edges and fill square and tongue and groove joints with sealant after jointing. Seal over all fixing heads. Refer to tiling section for tiling.

3.9 WATERPROOFING MEMBRANE - WET AREAS

Ensure all sheet fixing is completed to James Hardie® installation requirements before the primer and waterproofing membrane is applied. Refer to waterproofing section for waterproofing installation and manufacturers requirements. If using NZBC E3/AS2, use only 19mm sheet with joists at 400mm centres and blocking at 1200mm centres.

3.10 CUT SHEETS

Ensure the minimum length of any site cut sheet is 800mm minimum or more.

3.11 FORMING HOLES

Required holes accurately formed and cut to James Hardie® requirements.

3.12 CONTROL JOINTS

Form control joints where floor dimensions exceed 4.8 metres in the long direction and where existing structural joints are located. Position joints symmetrical about the centre of the floor where possible. Form control joints where there are changes in wall direction and at doorways where the tiled surface is carried through into the next room. When laying tiles the joint location must coincide with the control joint in the underlay.

Place a 6-8mm diameter polyethylene backing rod in the bottom of the joint between the sheets and fill the joint with a suitable flexible sealant. All square edges to be fully supported.

Completion & Commissioning

3.13 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 SECURA™ INTERIOR FLOORING

Location:	First Floor EnSuite
Brand:	James Hardie®
Type:	Secura™ Interior Flooring
Thickness:	19mm
Fixings:	Timber; 50mm x 2.87mm RounDrive , stainless steel or hot dipped galvanized nails or stainless steel screws

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6221A ARDEX TILING SOLUTIONS

1 GENERAL

This section relates to the supply and installation of ARDEX New Zealand internal and external floor tiling systems.

It includes:

- Primers
- Waterproofing systems
- Adhesives
- Sealants
- Grouts

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

CFC	Compressed fibre cement
PVC	Polyvinyl chloride
WMAI	Waterproofing Membrane Association (NZ) Incorporated
WPM	Waterproofing membrane

Documents

1.2 DOCUMENTS

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

NZBC D1/AS1	Access routes
NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
NZBC G3/AS1	Food preparation and prevention of contamination
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
ISO 13007.1	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for adhesives
ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
NZS 4121	Design for access and mobility - Buildings and associated facilities
WMAI CoP	Code of Practice for Internal Wet Area Membrane Systems

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
ARDEX Tiling and Substrate Preparation Systems (October 2023)
ARDEX Product Technical Data Sheets
ARDEX Technical Tiling Systems Bulletins
ARDEX Product Building Product Information Sheets
ARDEX Tiling General Care information sheet
BRANZ Appraisal 472 (2022) - ARDEX Undertile Internal Liquid Waterproofing Membranes - Amended 24 May 2024
BRANZ Appraisal 473 (2022) - ARDEX Undertile External Liquid Waterproofing Membranes - Amended 24 May 2024
BRANZ Appraisal 727 (2023) - ARDEX Undertile Sheet Membrane (WPM 750 and WPM 1000)
BRANZ Appraisal 925 (2024) - ARDEX WPM 1000 External Deck Membrane

Manufacturer/supplier contact details

Company:	ARDEX New Zealand Ltd
Web:	www.ardex.co.nz
Email:	info@ardexnz.com
Telephone:	0800 227339

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Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

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

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

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 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 NO SUBSTITUTIONS

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

Compliance information

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Applicator approval certificate from the manufacturer / importer / distributor
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents

Performance - Slip resistance

1.8 SLIP RESISTANCE - SURFACES EXEMPT FROM TESTING

Walking surfaces comply with NZBC D1/AS1, Table 2 for slip resistance requirements and are exempt from testing.

2 PRODUCTS

Materials - substrate preparation

2.1 FLOORING UNDERLAY

Fibre cement board to AS/NZS 2908.2 manufactured from cellulose fibre, Portland cement, sand and water, or glass-mat gypsum board manufactured from gypsum core with coated fiberglass mat facing.

2.2 ARDEX MULTIPRIME

One part, water-based primer for porous substrates.

2.3 ARDEX P 9

One part, water-based primer for non-porous substrates.

Materials - waterproofing

2.4 ARDEX WPM 001

One component, fibre reinforced, acrylic polymer, liquid waterproofing membrane.

Materials - adhesives

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2.5 ARDEX X 17

Flexible, polymer modified, cement-based adhesive, formulated with non-slumping mastic type properties. Classified C2TES1 to ISO 13007.1.

2.6 ARDEX X 18

Flexible, polymer fortified, cement-based adhesive, formulated with non-slumping mastic type properties. Classified C2TES1 to ISO 13007.1

2.7 ARDEX FG 8

Fine sanded, cement-based standard grout for joints 1mm to 8mm wide. Classified CG2W to ISO 13007.3.

2.8 ARDEX GROUT BOOSTER

Water-based, synthetic polymer grout additive for use with cement-based grouts to improve adhesion strength, flexibility and abrasion resistance.

Undertile heating

2.9 UNDERTILE HEATING

Refer to appropriate underfloor heating section for electric heating systems under tiles.

Components

2.10 ARDEX ST TAPE

Uncured, self-adhesive butyl tape, fleece lined one side.

2.11 TRIMS

Tile trim, edge strips, floor finish divider strips and weather bars. Available in aluminium, brass and stainless steel. 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.

Moisture content concrete:	75% maximum relative humidity, minimum 28 day cured
Moisture content plywood:	18% maximum
Moisture content particleboard:	16% maximum

Installation/application

3.3 APPLICATION GENERALLY

To AS 3958.1, ARDEX New Zealand Ltd instructions, and to WMAI CoP recommendations. Surfaces to be clean, sound and free of dust, oil, grease, curing compounds or release agents.

3.4 FLOORING UNDERLAY

Lay and fix flooring underlay to the manufacturer's instructions. Fill gaps between sheets and corners with a neutral cure silicone sealant.

3.5 APPLY PRIMER

Sponge, brush or roll primer liberally over entire substrate.

3.6 APPLY ARDEX LIQUID WPM

Reinforce corners and penetrations with ARDEX ST TAPE. Mix waterproofing components to ARDEX instructions. Brush or roll on liquid waterproofing membrane over prepared substrate. Apply two coats to achieve required minimum total dry film thickness to ARDEX product technical data sheet.

3.7 INSTALL UNDERTILE HEATING

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Refer to appropriate underfloor heating section for electric heating system under tiles.

Tiling

3.8 ADHESIVE APPLICATION GENERAL

For general floor tiling, use a 10mm x 10mm x 10mm notched trowel.
For large format tiles, use a 12mm x 12mm x 12mm notched trowel.
For mosaics, use a 4.5mm x 4.5mm x 4.5mm notched trowel.
Remove a tile periodically during installation to check for correct adhesive coverage. Do not fix tiles over skinned adhesive.

3.9 SETTING OUT

Confirm tile layout and bond pattern. Cut tiles to tile manufacturer's recommendations. Lay tiles level, maintaining falls to drainage where required (e.g. floor wastes). Provide joint widths to the tile manufacturer's recommendations.

3.10 MOVEMENT JOINTS GENERAL

Provide movement joints to AS 3958.1:

Depth:	Movement joints to go right through the tile and bed to the background.
Width:	6mm
Locations:	At walls, columns, nibs, hobs and similar.
	Around sanitary fixtures.
	Around fixtures interrupting the tile surface (e.g. at junctions with joinery fixtures, window/door frames, and built in cupboards).
	At changes in substrate.
Large areas:	Provide joints at not less than 4.5 metres spacing in both directions for internal floors.
	Provide joints at not less than 3.5 metres spacing in both directions for external floors.
	Provide joints over existing joints in the substrate.

3.11 APPLY ADHESIVE

Mix adhesive to ARDEX instructions. Spread adhesive over prepared surface with a notched trowel to ARDEX recommended bed thickness.

3.12 INSTALL TRIM

Press trim into wet adhesive.

3.13 INSTALL MOVEMENT JOINT ANGLE

Press angle into wet adhesive.

3.14 LAY TILES

Firmly press tiles into the adhesive bed for full contact between tile and adhesive with no voids. Butter the back of tiles with ribbed or keyed underside before laying into adhesive bed by spreading a thin layer of adhesive on the back of the tile. Remove surplus adhesive from tile surfaces before adhesive sets.

3.15 APPLY GROUT

Mix grout to ARDEX instructions. Work grout into joints with a rubber trowel. Allow the grout to firm up in the joint before wiping tile surface with a damp, dense sponge.

3.16 INSTALL MOVEMENT JOINT INSERT

Place insert between movement joint angles.

3.17 INSTALL MOVEMENT JOINT BACKING ROD

Place PEF backing rod into movement gaps. Apply a continuous bead of silicone sealant over PEF backing rod.

Completion

3.18 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.ardex.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

4.1 TILES

Location:	OWNER SELECTION
Supplier:	OWNER SELECTION
Type:	OWNER SELECTION

ARDEX system - residential floors & walls

4.2 ARDEX INTERNAL TILING SYSTEM OVER CONCRETE FLOOR

Location:	Owner selection
Substrate:	Concrete
Primer:	ARDEX Multiprime
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.3 ARDEX INTERNAL TILING SYSTEM OVER CONCRETE FLOOR - HEATED

Location:	Owner selection
Substrate:	Concrete
Heating system:	Refer Undertile Heating section
Primer:	ARDEX Multiprime
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.4 ARDEX INTERNAL TILING SYSTEM OVER CONCRETE FLOOR - WET AREA

Location:	GF Bathroom
Substrate:	Concrete
Primer:	ARDEX Multiprime
WPM:	ARDEX WPM 001
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.5 ARDEX INTERNAL TILING SYSTEM OVER CFC FLOORING OVERLAY

Location:	Owner selection
Substrate:	Compressed fibre cement sheet overlay
Levelling:	ARDEX K 65
Primer:	ARDEX Multiprime
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.6 ARDEX INTERNAL TILING SYSTEM OVER CFC FLOORING OVERLAY - HEATED

Location:	Owner selection
Substrate:	Compressed fibre cement sheet overlay
Heating system:	Refer Undertile Heating section
Levelling:	ARDEX K 65
Primer:	ARDEX Multiprime
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.7 ARDEX INTERNAL TILING SYSTEM OVER CFC FLOORING OVERLAY - WET AREA

Location:	FF Bathroom
Substrate:	Compressed fibre cement sheet overlay
Levelling:	ARDEX K 65

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Primer:	ARDEX Multiprime
WPM:	ARDEX WPM 001
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

4.8 ARDEX INTERNAL TILING SYSTEM OVER CFC FLOORING OVERLAY - HEATED WET AREA

Location:	FF Bathroom
Substrate:	Compressed fibre cement sheet overlay
Heating system:	Refer Undertile Heating section
Levelling:	ARDEX K 65
Primer:	ARDEX Multiprime
WPM:	ARDEX WPM 001
Adhesive:	tiler selection appropriate to tile selection
Grout:	tiler selection appropriate to tile selection
Grout colour:	tiler selection appropriate to tile selection

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire
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

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS

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

1.6 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to WorkSafe: Guidelines for the management of lead-based paint for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.7 MATERIAL SAFETY DATA SHEET

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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.

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

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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.

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

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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 - gypsum plaster

3.20 PREPARING GYPSUM PLASTER

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

Preparation - unpainted linings

3.21 PREPARING FIBROUS PLASTER

Check for and remove release agents and other contaminants by washing with clean water or solvent and allow to dry. Fill cracks and surface imperfections with patching plaster and lightly sand smooth. Remove dust.

3.22 PREPARING PLASTERBOARD

Check that joints are prepared to a smooth level surface finish. Fill cracks and surface imperfections with the sheet manufacturer's required stopping compound and lightly sand smooth. Remove dust.

Preparation - painted surfaces generally

3.23 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.

3.24 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water. Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.25 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

3.26 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.

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3.27 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.

3.28 CONCEALED JOINERY SURFACES

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

3.29 CONCEALED METAL SURFACES

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

3.30 DOORS

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

3.31 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.

3.32 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

3.33 PAINTING GENERALLY

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

3.34 MIXING

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

3.35 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

3.36 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.37 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.

3.38 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.

3.39 LIGHTLY SAND

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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.

3.40 DEFECTIVE WORK

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

3.41 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

3.42 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.

3.43 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.

3.44 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.

3.45 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.

3.46 REPLACE HARDWARE

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

4 SELECTIONS

4.1 SELECTIONS

Refer to 6721 PAINTING INTERIOR for selections.

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6721 PAINTING INTERIOR

1 GENERAL

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

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

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.

Warranties

1.2 WARRANTY

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

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

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

Paint systems

4.1 ALL SURFACES

Brand: owner selection based on selected subcontractor

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7411C CONTINUOUS SPOUTING RAINWATER SYSTEMS

1 GENERAL

This section relates to **Continuous Group** fascia and rainwater disposal systems. It includes:

- Continuous Group Metal Spouting system
- Continuous Group Metal Downpipe system

1.1 ABBREVIATIONS

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

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

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:

NZBC E1/AS1	Surface water
NZBC E2/AS1	External moisture
AS 1566	Copper and copper alloys - Rolled flat products
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Continuous Group Fascia, Spouting and Downpipe Systems.

Copies of the above literature are available from www.continuous.co.nz or by contacting Continuous Group:

Web:	www.continuous.co.nz
Email:	cg@continuous.co.nz
Telephone:	0800 50 1993

Branch Contact	**E-mail**
Otago	otago@continuous.co.nz

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide material manufacturer/supplier warranty for the following materials:

ColorCote® MagnaFlow™ & Colorsteel® Maxam™

10 years:	For failure of paint coating adhesion (manufacturer's standard warranty)
15 years:	For weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

ColorCote® AlumiGard™

10 years:	For failure of paint coating adhesion (manufacturer's standard warranty)

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15 years: For weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)

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

Refer to Continuous Group for comprehensive warranty terms, conditions and environmental considerations based on performance requirements to AS/NZS 2728. and the correct material selection according to NZS 3604 section 4, Durability.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years: Weatherproofing failure caused by substandard workmanship and/or sealants.

- 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 completion of the installation.

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 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Continuous Group installers and local agents to be experienced competent trades people, familiar with the materials and the techniques specified.

1.8 NO SUBSTITUTIONS

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

1.9 MATERIAL SELECTION

Fascia, spouting and downpipes are categorised as a “Sheltered environment”. Ensure correct materials are selected according to exposure zones detailed under NZS 3604, section 4 Durability.

1.10 MAINTENANCE

To ensure the useful life and to uphold warranty conditions of Continuous Group fascia and rainwater systems, regular maintenance is required. Refer to Continuous Group for specific information.

1.11 INFORMATION FOR OPERATION AND MAINTENANCE

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

Provide this information prior to practical completion.

Compliance information

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Performance

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1.13 TEST

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed, and that no ponding occurs. Comply with the requirements of NZBC E1/AS1, section 4.3.

1.14 DESIGN - NZBC E1/AS1

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with NZBC E1/AS1, section 4.0 Downpipes and section 5.0 Gutters. Refer to NZMRM CoP recommendations, sections 5.3 Gutters and 5.6 Downpipes.

1.15 DESIGN - NZBC E2/AS1

Dimensions, depths, materials & overflows to be designed according to NZBC E2/AS1 section 8.1.6. Refer to NZMRM CoP recommendations, sections 5.3 Gutters and 5.6 Downpipes.

2 PRODUCTS

Materials

2.1 PRE-PAINTED STEEL

ColorCote® MagnaFlow™, pre-painted G300 steel with a minimum alloy/zinc coating of 200 gsm/m² coated, to AS/NZS 2728.

2.2 PRE-PAINTED ALUMINIUM

Colorcote® AlumiGard™, pre-painted 5005-H34 aluminium coated toAS/NZS 2728.

Products

2.3 CONTINUOUS SPOUTING

Manufactured by Continuous Group using onsite plant to provide made to measure continuous lengths of spouting. Complete with matching brackets and fasteners. Spouting to be sized to comply with NZBC E1/AS1 and NZBC E2/AS1 8.1.6.
Refer to NZMRM CoP recommendations. Refer to SELECTIONS for type.

2.4 DOWNPIPES

Manufactured and supplied by Continuous Group. Complete with matching brackets and fasteners. Downpipes to be sized to comply with NZBC E1/AS1 and installed to NZBC E2/AS1, clause 8.1.6. Refer to NZMRM CoP recommendations. Refer to SELECTIONS for type.

Components

2.5 BRACKETS - SPOUTING

Manufactured from aluminium to comply with NZBC E2/AS1 table 20 requirements for exposure zones B,C,D & E “Sheltered environment” and NZS 3604 section 4, Durability.

2.6 BRACKETS - DOWNPIPES

Manufactured from aluminium to comply with NZBC E2/AS1 table 20 requirements for exposure zones B,C,D & E “Sheltered environment” and NZS 3604 section 4, Durability.

2.7 SPOUTING DROPPERS

Aluminium or PVC-U droppers for pre-painted steel or pre-painted aluminium spouting. Copper or PVC-U droppers for copper spouting. All droppers to be sized to fit inside the downpipe.

2.8 DOWNPIPE OFFSETS

Diecast aluminium (male/female) bends and tees for pre-painted steel or pre-painted aluminium downpipes. Mitered soldered or sealed bends and tees for copper spouting. All offsets (bends or tees) to have a minimum fall of 5°.

2.9 SEALANT

Selleys backing sealant (Sil-X advanced polymer) or premium grade neutral cure silicone.

2.10 SNOW STRAPS

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Snow straps connected to roofing and spouting at maximum spacing of 600 mm. Material and colour to match roofing and/or spouting.
Refer to NZS 3604, Section 15 and to NZMRM CoP recommendations.
Refer to SELECTIONS for type.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.
Handle and store all fascia and rainwater products 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 ROUTINE MATTERS

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

3.3 SUBSTRATE

Check that the substrate is level and true to line and face, and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

3.4 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the fascia and rainwater system for thermal movement in the lengths of the products. Refer to NZMRM CoP recommendations.

3.5 ELECTROLYTIC CORROSION

Keep all metals which are subject to electrolytic action separate from each other, and from treated timber, concrete and other lime-based substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for fasteners, fascia and rainwater goods, against the materials they will be in contact with. Refer to NZBC E2/AS1, table 21.

Installation - general

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALLATION GENERALLY

Install to NZMRM CoP recommendations where not otherwise specified.

Installation - spouting

3.8 CONTINUOUS EMERGENCY OVERFLOW SYSTEM (CEOS)

Spouting must be installed with the back lower than the fascia board or cladding, to allow for draining of overflow water through the gap between the spouting back and the fascia or cladding. All Continuous Group Rainwater systems are designed to be used with a bracket system which creates a minimum gap of 3 mm.
All installation to NZMRM CoP section 5.3.2.

3.9 INSTALL SPOUTING BRACKETS

Screw-fix spouting brackets vertically to allow for a Continuous Emergency Overflow System. Brackets for external gutters to be located within 300 mm of all stop-ends, corners and rainwater heads. Maximum bracket spacing 750 mm for gutters < 175 mm wide, and 600 mm for gutters 175 – 300mm wide. In snow load areas, brackets to be fixed at maximum spacing of 600 mm.
Brackets should be installed to provide a recommended 1:500 fall of spouting towards the outlets, to prevent ponding. Screw-fix brackets true-to-line.
All installation to NZMRM CoP recommendations section 5.0 Roof Drainage.

3.10 INSTALL SPOUTING

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Assemble and fit spouting to brackets. Cut out and form corners, stop-ends and dropper holes neatly and fit, rivet and seal around all joints. Leave a rear emergency overflow gap of minimum of 2 mm as per NZMRM CoP, section 5.3.2 and to comply with NZBC E1/AS1, clause 5.5.2.
All installation to NZMRM CoP recommendations section 5.0**,** Roof Drainage.

Installation - downpipes

3.11 INSTALL DOWNPIPES

Form downpipes complete with offsets as needed, with all joints lapped and sealed as required. Screw fix with matching pipe brackets to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. Copper downpipes can be brazed or soldered. All installation to NZMRM CoP recommendations, section 5.0 Roof Drainage.

Installation - components

3.12 INSTALL OUTLETS AND OVERFLOWS

Install outlets and overflows where required to NZMRM CoP, clauses 5.5.3, Overflows.

3.13 INSTALL SNOW STRAPS

Install snow straps where required, to suit snow loadings in NZS 3604, section 15.2.

Completion

3.14 COMPLETION MATTERS

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

4 SELECTIONS

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

Products

4.1 CONTINUOUS GROUP - RESIDENTIAL SERIES SPOUTING

Manufacturer:	Continuous Group
Profile/size:	Quartz 135mm
Base material:	Colorcote® MagnaFlow™ (BMT 0.55 mm) - also available in Colorsteel Maxam® (BMT 0.55 mm)
Brackets:	External

4.2 CONTINUOUS GROUP - EZI-FLO SERIES DOWNPIPES

Manufacturer:	Continuous Group
Profile/size:	EF-80 – 80mm Round downpipes
Base material:	Colorcote® MagnaFlow™ (BMT 0.55 mm) - also available in Colorsteel Maxam® (BMT 0.55 mm)
BMT:	Polyester powder coated extruded aluminium (BMT 1.6-1.9 mm)
Brackets:	Adjustable clamp bracket

Components

4.3 CONTINUOUS GROUP - SNOW SOLUTIONS

Manufacturer:	Continuous Group
Profile/size:	as appropriate for selected spouting profile
Base material:	Colorcote® MagnaFlow™ (BMT 0.55 mm) - also available in Colorsteel Maxam® (BMT 0.55 mm)

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7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

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

NZBC G1/AS1	Personal hygiene
NZBC G12/AS1	Water supplies
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.
Stainless steel pipe and associated fittings
PVC,PE polyethylene or polypropylene pipe including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

3.2 ELECTROLYTIC ACTION

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

3.3 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

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

3.4 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2, as modified by NZBC G13/AS3, and jointing to PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.5 PENETRATIONS

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At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.6 TEST

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations,as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.7 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

Brand/type: plumber's selection

4.2 EXPOSED PIPES AND TRAPS

Brand/type: plumber's selection

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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS

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

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

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

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

Components

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2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.
Underground PVC-U pipe to be classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to AS/NZS 3500.2, 4.6 Gullies, as modified by NZBC G13/AS3.

2.5 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

Foul water

2.6 TRENCH BACKFILLING MATERIAL, FOUL WATER - AS/NZS 3500.2

Bedding and backfilling material to AS/NZS 3500.2, 5.4, Bedding of drains, and for concrete, if required, AS/NZS 3500.2, 5.3 Concrete Support.

3 EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.
Trenches running parallel, below and close to foundations of buildings to NZS 3604 or NZS 4229 to be separated to:

- NZBC E1/AS1, 3.9.7, Proximity of Trench to Building, for stormwater and subsoil drains.
- AS/NZS 3500.3, 6.2.8, Installation near and under buildings, as modified by NZBC E1/AS2.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

3.2 MANUFACTURER'S REQUIREMENTS

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

3.3 FOUL WATER DRAINAGE GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2 and complete all tests to AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033.

3.4 SURFACE WATER DRAINAGE GENERALLY - AS/NZS 3500.3

Carry out stormwater drainage work to AS/NZS 3500.3, and complete all tests to AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2.
Lay uPVC pipe systems to relevant sections of AS/NZS 2032, AS/NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and AS/NZS 2566.1.

3.5 LAY FOUL WATER DRAINS

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

3.6 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to AS/NZS 3500.2, section 4.6, Gullies.

3.7 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

3.8 INSTALL SURFACE WATER SUMP

To NZBC E1/AS1 or to AS/NZS 3500.3 section 7 as modified by NZBC E1/AS2, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

3.9 SOAKHOLES OR TRENCHES

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Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.

3.10 TESTING - FOUL WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1, 7.1 Test Methods or AS/NZS 3500.2, section 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations, as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.11 TESTING - SURFACE WATER

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC E1/VM1, 8.0 Drain Leakage Tests or AS/NZS 3500.3, section 9, as modified by NZBC E1/AS2 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Backfilling and encasement - Foul water and surface water

3.12 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

3.13 TRENCH BACKFILLING GENERALLY - FOUL WATER

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid. Up to 300mm above the pipe, compaction shall be by tamping by hand tool over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing or distorting the drain. Run marker tape along line of the pipe on top of the bedding.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg. For plastic based pipes, ensure care taken to avoid impact loading of the pipe.

3.14 TRENCH BACKFILLING GENERALLY - SURFACE WATER - AS/NZS 3500.3

Trench fill to be placed in loose layers not more than 200 mm thick and compacted to not less than 90% or 95% under pavements of the standard maximum dry density specified in AS 1289.5.4.1 or AS 1289.5.6.1, in such a way that the pipes are neither dislodged nor damaged.
The finished surface (top of trench fill) and the trench surround shall be restored, as near as practicable, to the level and condition of the existing surface before commencement of the excavation.

3.15 FOUL WATER TRENCH BACKFILLING - AS/NZS 3500.2

Carry out foul water trench backfilling to AS/NZS 3500.2, 5.1, 5.2 and 5.5 as modified by NZBC G13/AS3.
PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

3.16 SURFACE WATER TRENCH BACKFILLING - AS/NZS 3500.3

Carry out surface water trench backfilling to AS/NZS 3500.3, 6.3.5.2.
PVC-U pipe to AS/NZS 2032 and polyethylene pipes to AS/NZS 2033.

4 SELECTIONS

4.1 PVC-U PIPES

Brand/type: plumber/drainlayer selection

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7612 RESIDENTIAL EXTRACT SYSTEMS

1 GENERAL

This section relates to the supply and installation of ventilation systems for residential applications. It includes:

- hole house ventilation systems with heat recovery

1.1 RELATED WORK

Refer to the electrical section(s) for general electrical requirements.

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 E3/AS1	Internal moisture
NZBC G4/AS1	Ventilation
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this part of the work to be available on site on request and provided to the owner on completion.

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

2 years	For parts and labour

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

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For parts and labour

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

Requirements

1.6 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

1.7 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.8 ELECTRICAL QUALIFICATION

Registered electrician to carry out work to Electricity (Safety) Regulations 2010.

1.9 NO SUBSTITUTIONS

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

1.10 INFORMATION FOR OPERATION AND MAINTENANCE

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Refer to the general section 1234 DOCUMENTATION for provision of the general operation and maintenance information as electronic PDF format documents.

Provide this information prior to practical completion.

1.11 EXTRACT FLOW RATES

To NZBC G4/AS1.
Extract fans (including associated ducts) to have a minimum flow rate of:

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

Compliance information

1.12 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer, importers or distributors warranty
- Installer warranty
- Other information required by the BCA in the Building Consent Approval documents.

2 PRODUCTS

Kitchen extract systems

2.1 KITCHEN RANGEHOOD - RECIRCULATING

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filters, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.
Refer to SELECTIONS for options.

Bathroom and laundry extract systems

2.2 BATHROOM / LAUNDRY TWO-ROOM EXTRACT VENT

Mechanical venting system comprised of ceiling diffusers, metal ducting serving back to back rooms, a single motor unit housing mixed flow inline fan with two way switch, and proprietary vent cap and roof flashing.
Refer to SELECTIONS for options.

2.3 WALL MOUNTED MVHR UNIT, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical ventilation and heat recovery unit ducted system comprised of integrated fan and heat recovery unit, solid insulated duct sleeve sloped to remove condensation, to the main intake and exhaust ducts, c/wexterior weatherproof grille and flashing, manifolds c/w sound attenuation and flexible ducts to internal supply & extract locations.
Refer to SELECTIONS for options.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Installation - mechanical ventilation

3.2 INSTALL KITCHEN RANGEHOOD

Install rangehood to AS/NZS 3000, AS/NZS 60335.1 and manufacturer installation instructions. Plug into electrical socket.

3.3 INSTALL WALL MOUNTED MVHR UNIT

Install MVHR unit to manufacturer requirements to AS/NZS 3000 and NZBC G4/AS1. Plug into electrical socket.
Provide condensate drain.
Install ducting to exterior c/w airtightness tape to all junctions and external wall penetrations.
Install manifolds and flexible distribution ducting complete with all outlet grilles and plenums.
Cap all open ends during construction to keep all ductwork clean internally.

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3.4 ELECTRICAL INSTALLATION

Install switch and socket outlets to AS/NZS 3000 and AS/NZS 60335.1. Refer to electrical section(s) for requirements.

Completion & commissioning

3.5 COMPLETION MATTERS

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

3.6 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning. System to be commissioned and balanced on completion.

4 SELECTIONS

Kitchen extract systems

4.1 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL / SOFFIT

Location:	as per plan
Manufacturer:	owner selection

Bathroom and laundry extract systems

4.2 WALL MOUNTED MVHR UNIT

Location:	plant room
Manufacturer:	owner selection

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7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- complete with componentry
- electrically-powered fittings

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:

AFDD	Arc Fault Detection Device
ELV	Extra Low Voltage
GLS	general lighting service
IP	international (ingress) protection classification
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
NZS 4514	Interconnected smoke alarms for houses
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60335.1	Household and similar electrical appliances - Safety - General requirements
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.

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AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61643	Components for low voltage surge protection devices

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).
TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are, where relevant, to be provided to the owner at completion of the works.

Warranties

1.4 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:	Warranty period

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

Requirements

1.5 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Cable Installers Guidelines for Telecommunication Services for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Workers and supervisors to be appropriately qualified to applicable legislative requirements. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.8 CONFIRM SELECTIONS

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

1.9 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations 2010, prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high risk electrical work as required by regulation 70.

1.10 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

2 PRODUCTS

2.1 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs

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Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction 2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity 2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction 2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.2 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 3439.3, or AS/NZS 61439.3, and installed in accordance with AS/NZS 3000. Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations and to include smart meter.

2.3 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with AS/NZS 3190. MCBs to 4.5kA or 6kA rated.

2.4 SURGE PROTECTION

Protection for the homes appliances with IEC 61643 Class ll surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class lll surge protection to switched socket outlets.

2.5 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.6 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units.
Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.7 SWITCHED SOCKET UNITS

10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to AS/NZS 3100, AS/NZS 3112 and AS/NZS 3113, single or multi gang as detailed.

2.8 CEILING ROSES

White plastic mounting base with screwed cover, manufactured to AS/NZS 3113. Terminal type. Suspended fittings to have sheathed round flexible cord to AS/NZS 3008.1.2. Refer to SELECTIONS.

2.9 HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.10 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.11 FIRE & SMOKE ALARM SYSYEM

Refer to SELECTIONS.

2.12 LIGHT FITTINGS

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Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.

2.13 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

- Existing fittings or retrofit situations, fittings maybe unmarked.
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F, & IC-4.

Refer to clause INSULATION & GENERAL CLEARANCES for clearances from insulation and other elements.

2.14 EXHAUST FANS

Whole house mechanical ventilation with heat recovery system for ventilation to NZBC G4/AS1 and better.

2.15 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with AS/NZS 60335.1, scratch resistant powdercoated or chrome finish.

2.16 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.

2.17 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance. Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights

3 EXECUTION

Conditions

3.1 ROUTINE MATTERS

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

Installation

3.2 DISTRIBUTION BOARD

Fit to AS/NZS 3000 and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.3 CIRCUIT PROTECTION

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.4 EARTHING CONDUCTIVE STRUCTURE & MATERIALS

Earth all at risk structural metalwork and conductive building materials to AS/NZS 3000, 5.4.6, and the Electricity (Safety) Regulations 2010.
If they form part of the building, this includes:

- Structural steel frames or members
- Light steel framing
- Exposed conductive materials, like metal sink/tub or vanity benches etc, with attached electrical units or equipment

3.5 EQUIPOTENTIAL BONDING

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Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.
If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

3.6 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.7 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A.

3.8 EARTH LEAKAGE PROTECTION

Install RCD protection to AS/NZS 3000.

3.9 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000 and AS/NZS 1768. When fitting IEC 61643 Class ll protection at the switchboard, protect the device by a dedicated MCB.

3.10 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to AS/NZS 3000.

3.11 RCD-AFDD COMBINED - RESIDENTIAL INSTALLATIONS

Install a 30mARCD - AFDD combined device (RCD Type II) at the switchboard for all final sub circuits not exceeding 20A, to control and protect outlets and lighting to AS/NZS 3000, (2018, 2.6 & 2.9). Protect over 20A to 32A final sub circuits with separate RCD and to AS/NZS 3000.

3.12 RCD - SPECIFIC INSTALLATIONS

Install fixed wired RCD protected outlets (SRCD) in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.13 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.14 CABLING

Install wiring systems to AS/NZS 3000. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

3.15 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

3.16 WALL BOXES

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Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.17 SWITCHES AND SWITCHED SOCKET UNITS

Fit all switch units and socket units to the manufacturers requirements with heights and mounting directions as indicated in SELECTIONS.

3.18 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.19 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer requirements.

3.20 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

3.21 INSULATION & GENERAL CLEARANCES

Some electrical and mechanical services, and equipment may need to have a gap to insulation and some building elements. The gaps should be to the NZS 4246 based tables below or to the equipment manufacturers requirements if they require larger gaps. Smaller gaps to manufacturers requirements can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings).

Installed gap not to be more than 50mm bigger than the required gap.
The following tables are subject to:

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

3.22 LIGHT FITTINGS TO INSULATION

Type of fitting	Minimum insulation clearance	Comments
Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	To NZS 4246. NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Insulation to be secured.
Recessed, CA 80, CA 90, or CA 135.	Abut fittings	To NZS 4246. Do not cover the fittings.
Recessed, IC, IC-F, or IC-4.	Abut & cover fittings.	To NZS 4246. Ensure insulation complies.
Recessed, marked Do-Not-Cover	Manufacturer clearances	To NZS 4246. Do not cover the fittings.
Independent control gear	Place on top of insulation & 50mm from fittings	To NZS 4246. If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.

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Surface fittings not exposed to insulation	Nil	To NZS 4246. Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	To NZS 4246. This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Insulation to be secured.

3.23 RECESSED LIGHT FITTINGS TO COMBUSTIBLE BUILDING ELEMENTS

Type of recessed fitting	**Minimum building element clearance ****	**Comments**
Marked NON-IC, or unmarked, ≤100W	100mm, vertical & horizontal	To AS/NZS 3000:2018
Marked NON-IC, or unmarked, >100W	200mm, vertical & horizontal	To AS/NZS 3000:2007
CA 80, CA 90 or CA 135	100mm, vertical & horizontal	To AS/NZS 3000:2018
IC, IC-F or IC-4	100mm, horizontal NA, vertical	To AS/NZS 3000:2018 To be NA vertical, fitting must be covered by insulation. If not covered use 100mm clearance.
Marked Do-Not-Cover	100mm, vertical & horizontal	To AS/NZS 3000:2018. Manufacturer clearances if greater than 100mm

****** Combustible building elements exclude metal elements, but include timber framing or other timber based elements, and normal linings etc. Highly flammable materials & those likely to melt will need more clearance.

3.24 INBUILT RECESSED HOT APPLIANCES TO INSULATION

Appliance	**Minimum insulation clearance**	**Comments**
Electrical heaters	Manufacturer clearances	To NZS 4246.
Electrical heaters	100mm	Manufacturer clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.
Heat producing appliances & equipment	Manufacturer clearances	To NZS 4246.
Heat producing appliances & equipment	50mm	Manufacturer clearances not known. To NZS 4246. Clearance may be able to be reduced with non-combustible insulation. Insulation to be secured.

Note - Appliances and equipment excludes cables, junction boxes, light switches & power sockets etc

3.25 EXTRACTS, VENTS & ROOF UNDERLAY TO INSULATION

Appliance	**Minimum insulation clearance**	**Comments**
Ducted fan motors	50mm	To NZS 4246. Includes ducted rangehoods, extractors etc. Applies to the motor unit and electrical enclosures (not the ducts).
Ducted fan ducts	Abut	To NZS 4246. Excludes motor unit and electrical enclosures.
Unducted fan motors usually discharging to ceiling space	200mm	To NZS 4246. Includes unducted, rangehoods, extractors etc, discharging into roof space. To prevent debris falling into motor. Clearance may be able to be reduced, by providing a fixed barrier around the vent.

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Roofing material/underlay	25mm	To NZS 4246. Maintain clearance from underside of roofing or flexible roofing underlay, to prevent wicking.

3.26 ELECTRIC HOT WATER SYSTEM

For storage heaters, wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.27 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.28 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with AS/NZS 3000
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

3.29 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer recommendations:
Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

3.30 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Completion & Commissioning

3.31 COMPLETION MATTERS

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

4 SELECTIONS

Materials

4.1 DISTRIBUTION BOARD

Location: plant room

4.2 FIRE & SMOKE ALARM SYSTEM

Refer to appropriate fire and smoke alarm section:
7352 TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS for Type 1 interconnected smoke alarm system for domestic buildings.

Outlets - fittings

4.3 ALL ELECTRICAL FIXTURES, FITTINGS AND SWITCHED

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Item	Brand / type
Switch / socket outlets:	Owner selection