GOULDING

Project Specification

46 Shepherd Road, Hanleys Farm, Queenstown, New Zealand
Project Ref: QT105539
Date: 21 October 2026



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

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1220 PROJECT

1 GENERAL

This general section describes the project including:

- A description of the work
- Design construction safety
- Site description, features and restrictions
- Design parameters for design by contractor

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

1.2 DESCRIPTION OF THE WORK

New Dwelling as per Architectural plans

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Design Construction Safety

Principal's Health & Safety Matters

1.4 PRINCIPAL'S SITE HEALTH AND SAFETY PLAN

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

Site environment - Durability

1.5 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

1.6 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

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

Site environment - Seismic

1.7 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

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

The earthquake zone is: Zone 3

Archaeological discovery

1.8 REPORT FINDING ANY ANTIQUITIES AND ITEMS OF VALUE

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

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

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



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1250 TEMPORARY WORKS & SERVICES

1 GENERAL

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

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

Temporary works

1.1 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

1.2 MAINTENANCE OF TEMPORARY WORKS

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

1.3 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

1.4 SITE FENCING

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

Construct the fence with:

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

1.5 SITE FENCING - NON-PUBLIC AREAS

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

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

1.6 PROVIDE SEDIMENT AND SILT RUN OFF PROTECTION

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

Prevent silt run off by:

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

Provide sediment control by:

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

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

1.7 PROVIDE CONCRETE WASHWATER RUN OFF PROTECTION

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

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Control run off from:

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

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

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

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

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

Spilt or surplus material:

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

Pump washwater away from drains, waterways and adjoining property.

1.8 EXCAVATION SAFETY

To the Health and Safety at Work Act 2015.

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

Scaffolding

1.9 SCAFFOLDING

Provide scaffolding for the efficient execution of the works.

Comply with:

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

Temporary services

1.10 WATER

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

1.11 ELECTRICITY

To AS/NZS 3012.

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

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

1.12 IMAGING

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



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Care and protection - Site

1.13 LOCATE AND PROTECT SURVEY MARKS

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

1.14 LOCATE EXISTING SERVICES

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

1.15 PROTECT EXISTING SERVICES

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

1.16 PROTECT EXISTING LANDSCAPE ELEMENTS

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

1.17 MAKE GOOD - SITE

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

Care and protection - Project

1.18 TEMPORARY PROTECTION

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

1.19 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous

1.20 CONSTRUCTION KEYING AND SECURITY

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

1.21 TEMPORARY STORAGE

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

Rubbish removal

1.22 PERIODIC RUBBISH REMOVAL

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

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1270 CONSTRUCTION

1 GENERAL

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

- Quality control and assurance
- Noise and nuisance
- Set-out and tolerances
- Common execution requirements
- Qualifications
- Common product requirements
- 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.

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.

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1.6 PROVIDE INFORMATION TO NEIGHBOURS

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

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

1.7 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.

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1.17 SET-OUT

Set out the work to conform with the drawings.

1.18 USE OF SET-OUT INSTRUMENTS

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.

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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

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.

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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

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.

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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

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

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waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works.

1.57 CLEANING BY COMMERCIAL CLEANER

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

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

Commissioning

1.58 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.59 MOVING PARTS

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

1.60 COMMISSIONING - TESTS & CERTIFICATION

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

1.61 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.

1.62 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

1.63 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.

1.64 ADDITIONAL PRACTICAL COMPLETION REQUIREMENTS

Refer to the conditions of contract for the definition of practical completion and the conditions relating to practical completion.

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Defects period submissions

1.65 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

1.66 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
- backfilling behind basement retaining walls

Documents

1.1 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.

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2 PRODUCTS

2.1 EXCAVATED CLEAN FILL

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

2.2 VOLCANIC TUFF FILL

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

2.3 ROCK FILL

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

2.4 SAND FILL

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

2.5 HARD FILL

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

2.6 GRANULAR FILL

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

2.7 DRESSING COURSE

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

2.8 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

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3 EXECUTION

3.1 WASHOUT BAY FOR TRUCK

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

3.2 EXCAVATION GENERALLY

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

3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

3.4 PROTECT EXISTING WORK

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

3.5 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.

3.6 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.

3.7 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.

3.8 GENERAL EXCAVATION

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

3.9 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.

3.10 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.

3.11 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.

3.12 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.

3.13 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.

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3.14 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.

3.15 RETAINING WALLS

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

3.16 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

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3114E EXPOL UNDERSLAB INSULATION

1 GENERAL

This section relates to the supply and installation of Expol insulation foam boards for concrete slabs on ground.

It includes:

- EPS and XPS under slab insulation foam boards

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

DPM	Damp proof membrane
EPS	Expanded polystyrene
XPS	Extruded polystyrene

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC H1/AS1-AS2	Energy efficiency
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Expol under slab / slab edge insulation brochures
Expol technical product guide
Expol technical data sheets
Expol ThermaSlab edge installation instructions
Expol BPIR

Company	Expol Ltd
Web:	www.expol.co.nz
Email:	tech@expol.co.nz
Telephone:	09 634 3449 / 0800 863373
Facsimile:	09 634 0756

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.

2 PRODUCTS

Materials - under slab insulation

2.1 EXPOL SLABX200

Expol SlabX200, a 200kPa rated EPS under slab insulation sheets to AS 1366.3 and AS/NZS 4859.1. Available in 2400mm x 1200mm and in a range of thicknesses.

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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.

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 PROTECT

Do not subject the polystyrene to prolonged saturation or exposure to sunlight. Do not allow the polystyrene to come into contact with solvents.

3.4 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 INSTALLATION - GENERAL

Install under slab insulation to NZBC H1/AS1-AS2 and Expol Ltd installation requirements. Also install to NZS 4246 for all housing and buildings up to 300m².

3.7 INSTALL UNDERSLAB INSULATION

Install the polystyrene sheets once the polythene DPM has been laid. Place the polystyrene sheets on top of the polythene DPM and butt together. Do not place the polystyrene under any footings or slab thickenings. Cut holes in the polystyrene with a sharp knife to accommodate any services. Lay reinforcing steel mesh over the polystyrene on mesh chairs

Completion

3.8 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - under slab insulation

4.1 EXPOL SLABX200

Brand:	Expol SlabX200
Size:	2400mm x 1200mm
Thickness:	50mm
Compressive resistance at 10%:	200kPa
R value:	1.50

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3155AS ALLIED SUPERSLAB CONCRETE FLOOR SYSTEM

1 GENERAL

This section relates to the supply and installation of Allied Concrete SuperSlab/SuperSlab+concrete floor systems.
It includes:

- Engineered concrete reinforced floor system in accordance with its CodeMark Certificate of Conformity

1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

DPM	Damp proof membrane
EPS	Expanded polystyrene
GGBS	Ground granulated blast-furnace slag
PE	Polyethylene
PVC	Polyvinyl chloride
SCM	Supplementary cementitious materials
XPS	Extruded polystyrene

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

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC B1/AS1	Structural provisions for buildings
AS 1366.3	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 3631	New Zealand timber grading rules
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials

CodeMark CMNZ30086(ver K) - Allied SuperSlab Concrete Floors System

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Allied Concrete SuperSlab/SuperSlab+ Technical Manual (Rev J)
Allied Concrete Engineered Raft Floor System SuperSlab/SuperSlab+ brochure
Allied Concrete material safety data sheet for ready mixed concrete
QuickSet Thermal Modelling Report
QuickSet and QuickEdge details drawings
QuickSet Technical Specifications and QuickStart Instruction Manual
QuickSet and QuickEdge Installation Guides
BRANZ Appraisal 964 - Allied SuperSlab Concrete Floors

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Manufacturer/supplier contact details:

Company:	Allied Concrete Ltd
Web:	www.alliedconcrete.co.nz
Email:	sales@alliedconcrete.co.nz
Telephone:	0800 4 255433

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.

1.6 STEEL REINFORCING COMPLIANCE

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

1.7 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used during construction. Include records of workmanship during construction and photographs of as-built details. Make the information available to the Building Consent Authority inspector on request.

Compliance information

1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- 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

1.9 COMPLIANCE CODEMARK CERTIFICATE

Allied Concrete SuperSlab/SuperSlab+ concrete floor system meets the requirements of the NZBC when used within the conditions and limitations of its Certificate of Conformity CMNZ30086.

2 PRODUCTS

Materials

2.1 BLINDING

Compacted GAP 7 or sand blinding layer.

2.2 DAMP-PROOF MEMBRANE

0.25mm minimum PE to NZS 3604: clause 7.5.4, DPM.

2.3 POLYSTYRENE PODS

Allied Concrete SuperSlab/SuperSlab+ proprietary purpose made moulded expanded polystyrene pods manufactured to AS 1366.3. Sizes 1100mm x 1100mm x 220mm (North Island & South Island) or 1100mm x 1100mm x 300mm (South Island only).

2.4 SPACERS

Allied Concrete SuperSlab/SuperSlab+ proprietary or QPOD plastic spacers.

2.5 REINFORCEMENT

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

2.6 RE-ENTRANT INTERNAL CORNER STEEL REINFORCEMENT

Minimum 2 x HD12 bars Grade 500E to AS/NZS 4671.

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2.7 TOPPING SLAB REINFORCEMENT - MESH

Welded reinforcing mesh to AS/NZS 4671, Class E to NZBC B1/AS1 - Grade 500E, 2.29kg/m², minimum SE62 500E mesh or equivalent.

2.8 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.9 TIMBER FORMWORK

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

2.10 SUPERSLAB CONCRETE

20MPa or 25MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size. Allied Concrete SuperSlab mixes are suitable for direct placement and for pump applications. Refer to SELECTIONS.

2.11 ECRETE™ CONCRETE

A lower carbon concrete mix. 20MPa or 25MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size. Allied Concrete Ecrete™ mix is compatible for use with Allied Concrete SuperSlab/SuperSlab+ concrete floor systems. Ecrete™ mixes are suitable for direct placement and for pump applications. Refer to SELECTIONS.

Piling

2.12 PILING - TIMBER

Refer to 2316 DRIVEN TIMBER PILES AND POLES section.

2.13 PILING - CONCRETE

Refer to 2311 CAST IN PLACE CONCRETE PILING section.

2.14 SHEAR KEYS - CONCRETE

Drilled concrete shear key piles, 300mm diameter and 900mm deep, reinforced and located as specified by the Design Engineer.

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.

Application - general

3.3 SITE CLEARANCE

Clear the slab area of any vegetation and topsoil down to the subgrade level.

3.4 BUILDING PLATFORM

Create a building platform to a level surface to the required depth below finished floor level to suit Allied Concrete SuperSlab/SuperSlab+ concrete floor systems. Overall foundation height to include slab, blinding and underslab insulation thickness. Cut and/or fill sloping sites. Confirm finished floor level.

3.5 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 Allied Concrete SuperSlab/SuperSlab+ Technical Manual.

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3.6 TEMPORARY BUILDING PLATFORM DRAINAGE

Construct suitable drainage to keep excessive ground water off the building platform during and after construction as required, and to ensure run off onto adjoining properties is avoided.

Application - piling

3.7 PILING - TIMBER

Refer to 2316 DRIVEN TIMBER PILES AND POLES for the installation of timber piles.

3.8 PILING - CONCRETE

Drill for each pile as located on the drawings, place reinforcing to consulting engineers details and pour concrete to underside of footings. Refer to 2311 CAST IN PLACE CONCRETE PILING for the installation of concrete piles.

3.9 SHEAR KEYS – CONCRETE

Drill for each shear key pile as located on the drawings, place reinforcing to design engineer's details and pour concrete to underside of perimeter edge beam.

Application - pre-installation

3.10 UNDERGROUND SERVICES

Ensure underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and according to Allied Concrete SuperSlab/SuperSlab+ concrete floor system requirements, or within the slab depth where applicable.

3.11 BLINDING LAYER

Spread GAP 7 blinding layer to a depth of 10mm minimum and 20mm maximum extending 500mm to 1000mm beyond the perimeter of the slab. Blinding layer to be loose packed and levelled to a tolerance of +/-5mm.

3.12 INSTALL DAMP-PROOF MEMBRANE

Install DPM to NZS 3604 over the prepared blinding layer extending 50mm minimum to the outside of all edge beams. 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.

3.13 TIMBER FORMWORK

Construct formwork as required, well braced and tied to remain in position, straight and plumb during construction. Ensure formwork will provide for the topping depth, including rebates and the required concrete finish.

Application - Allied Concrete SuperSlab/SuperSlab+ concrete floor systems

3.14 PLACE POLYSTYRENE PODS

Place polystyrene pods in a regular waffle pattern using the spacers in the specified grid pattern to fit the floor plan. Cut pods on site with a saw or suitable hot wire as required. Cut holes for services and trim around piles as required on site.

3.15 INSTALL SPACERS

Install spacers and locations to the Allied Concrete SuperSlab/SuperSlab+ Technical Manual.

Form standard ribs between pods using Allied Concrete SuperSlab/SuperSlab+ 100mm spacers. Place the spacers at a minimum of one spacer along each edge of each pod or part pod. The ribs in both directions form a waffle pattern throughout the slab.

Form the edge beam using Allied Concrete SuperSlab/SuperSlab+ 300mm spacers. Place the spacers at 1200mm centres maximum along the perimeter of the slab at least and one spacer per pod or part pod.

Form ribs to support load-bearing walls using Allied Concrete SuperSlab/SuperSlab+ 300mm spacers. Place the spacers at a minimum of one spacer along the edge of each pod or part pod.

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3.16 PLACE REINFORCING: GENERAL

Install specified reinforcing to Allied Concrete SuperSlab/SuperSlab+ Technical Manual. Ensure specified minimum cover requirements are maintained.

3.17 PLACE REINFORCING STEEL TO INTERNAL RIBS

Place rib reinforcing bars in the bottom of the internal ribs and supported in the correct position by the Allied Concrete SuperSlab/SuperSlab+ spacers. Lap HD12 bars 600mm minimum. At the junction with the edge beam, each rib bar to sit on top of the edge beam bars and extend to the outermost bar. Allow for 40mm side cover within the rib. Place 1 x HD12 bar in each 100mm wide rib and 2 x HD12 bars in each 300mm wide rib. Allow 50mm bottom cover to bars where DPM is used.

3.18 PLACE REINFORCING STEEL TO EDGE BEAM

Place the two edge beam reinforcing bars in the bottom of the edge beam and supported in the correct position by the Allied Concrete SuperSlab/SuperSlab+ spacers. Tie one top edge beam bar below the mesh at the perimeter of the area covered by the polystyrene pods. Lap HD12 bars 600mm minimum. At corners, the inner bottom bars and the top bars cross each other and extend to 50 mm from the outside face of the edge beam. Tie these bars together where they cross. Tying of edge beam steel is only required at corners.

3.19 PLACE REINFORCING FOR RE-ENTRANT CORNER STEEL

Place two HD12 bars, 1200mm in length across the corner. Tie to the top of the mesh at re-entrant corners at 200mm centres with 50mm side cover from the internal corner.

3.20 TOPPING SLAB REINFORCING MESH - POLYSTYRENE PODS

Place topping slab reinforcing mesh over the pods and support on the mesh chairs spaced at 1200mm centres minimum, with at least two transverse bars of adjacent mesh minimum placed per pod and with one mesh chair minimum per part pod. Lap mesh 225mm minimum or to suit mesh suppliers details and tied at all laps.

3.21 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings. Form a rebate in slab for masonry veneer construction with a width dependent on the veneer width, cavity width and overhang. Waterproof the rebate with a bituminous sealer on both the vertical and horizontal faces.

3.22 TOPPING SLAB DEPTH

Concrete slab thickness 85mm minimum/100mm maximum. Refer to Allied Concrete SuperSlab/SuperSlab+ details.

3.23 PRE-PLACEMENT INSPECTION

Arrange for excavations, formwork and reinforcement to be inspected and passed by the Building Consent Authority.

3.24 CONCRETE PLACEMENT AND COMPACTION

Ensure the rib and edge beam canals are clean, free of debris. Pour the floor in a single pour using only Allied Concrete SuperSlab/SuperSlab+ mix concrete and 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.

Use Allied Concrete SuperSlab/SuperSlab+ mix for placement in the floor directly from the concrete truck chute or by concrete pump.

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 and ensure minimum specified topping thickness is achieved.

3.25 CONCRETE FINISHING

Float and trowel to provide a U3 finish to NZS 3114: table 2, Classes of floor, exterior pavement and invert finishes. Exposed edges of foundation to F5 finish.

3.26 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:

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

3.27 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints as shown on the plans after hardening to a depth of 25mm within 24 hours.

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 engineer.

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. 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.

3.28 CLEAN OUT SHRINKAGE CONTROL JOINTS

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

3.29 STRIKE FORMWORK

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

3.30 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.

Completion

3.31 COMPLETION MATTERS

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

3.32 CLEAN UP

Clean up surrounding areas following completion of the concrete placement.

4 SELECTIONS

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

4.1 ALLIED CONCRETE SUPERSLAB CONCRETE FLOOR SYSTEM - SPECIFIC DESIGN

Brand:	Allied Concrete SuperSlab concrete floor system - specific design
Formwork type:	Timber
Pod type/size:	Polystyrene - 1100mm x 1100mm x 220mm deep
Topping slab reinforcement:	minimum SE62 or equivalent
Concrete mix:	20Mpa - 202RSS
Topping slab thickness:	85mm minimum - 100mm maximum
Concrete surface finish:	U3 (interior)

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3410 STRUCTURAL STEEL

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

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

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC F5/AS1	Construction and demolition hazards
AS 1111.1	ISO metric hexagon bolts and screws - Product grade C - Bolts
AS 1111.2	ISO metric hexagon bolts and screws - Product grade C - Screws
AS 1112.1	ISO metric hexagon nuts - Style 1 - Product grades A and B
AS/NZS 1163	Cold-formed structural steel hollow sections
AS/NZS 1214	Hot-dip galvanized coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS 1554.2	Structural steel welding - Stud welding (steel studs to steel)
AS/NZS 1554.3	Structural steel welding - Welding of reinforcing steel
AS/NZS 1554.4	Structural steel welding - Welding of high strength quenched and tempered steels
AS/NZS 1554.5	Structural steel welding - Welding of steel structures subject to high levels of fatigue loading
AS/NZS 1594	Hot-rolled steel flat products
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2312.2	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 2: Hot dip galvanizing
AS/NZS 2312.3	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings - Part 3: Thermal metal stray coatings
NZS 3404.1	Steel Structures Standard
AS 3597	Structural and pressure vessel steel - Quenched and tempered plate
AS/NZS 3678	Structural steel - Hot-rolled plates, floorplates and slabs
AS/NZS 3679.1	Structural steel - Hot-rolled bars and sections
AS/NZS 3679.2	Structural steel - Welded I sections
AS/NZS 3750.9	Paints for steel structures - Organic zinc-rich primer
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 13918	Welding - studs and ceramic ferules for arc stud welding
GANZ	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users

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Requirements

1.3 QUALIFICATIONS

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

1.4 TOLERANCES

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

1.5 VERIFY DETAILS AND DIMENSIONS

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

1.6 TESTS

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

- Welds: Non-destructive examinations (NDE)

1.7 HOT WORK - FIRE SAFETY

Refer to section 1270 CONSTRUCTION

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2 PRODUCTS

2.1 STRUCTURAL STEEL

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

Steel members and sections steel grade table

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

2.2 WELDING CONSUMABLES

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

2.3 FLUX

Welding flux to be dry and from sealed containers.

2.4 BOLTS, NUTS AND WASHERS

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

Bolt Categories and tensioning

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

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

2.5 GROUT

To AS/NZS 5131, 5.8.

3 EXECUTION

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Preparation, assembly and Fabrication

3.1 GENERALLY

To AS/NZS 5131, Section 6.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.3 ROUTINE MATTERS

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

3.4 SURFACE FINISH

Grind off all burrs and sharp arrises.

3.5 CUTTING

To AS/NZS 5131, Section 6.5.

3.6 HOLING

To AS/NZS 5131, Section 6.7

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

Welding

3.7 WELDING GENERALLY

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

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

3.8 NON-DESTRUCTIVE WELD EXAMINATION

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

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

Mechanical fastening

3.9 MECHANICAL FASTENING GENERALLY

To AS/NZS 5131.

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

3.10 TENSIONING BOLTS

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

3.11 THREADS EXCLUDED FROM SHEAR PLANE

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

Erection of structural steel

3.12 ERECTION GENERALLY

To AS/NZS 5131, Section 11.

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

3.13 BOLTS AND ANCHORAGES

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

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

3.14 TEMPORARY WORK

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

3.15 SITE WORK

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

3.16 GROUTING SUPPORTS

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

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

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

3.17 DRIFTING

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

Finishing - preparation

3.18 ENCASED STEELWORK

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

3.19 ABRASIVE BLASTING

To AS/NZS 5131, Section 9.

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

Finishing - paint and protective coatings

3.20 PAINTING

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

3.21 UNPAINTED SURFACES

Do not paint:

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

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

3.22 PRIMING GENERALLY

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

3.23 PATCH PRIMING

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

3.24 COATING SYSTEMS

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

3.25 TOUCH-UP

Touch up primer. Apply protective coatings as specified.

3.26 TEMPORARY CONNECTIONS

Remove temporary elements on completion and restore the surface.

Completion & Commissioning

3.27 COMPLETION MATTERS

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

4 SELECTIONS

4.1 CONSTRUCTION CATEGORY

Construction category (to AS/NZS 5131)	Location
CC2	garage portal

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3811M MITEK (GANG-NAIL) PREFABRICATED TIMBER TRUSSES

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

DPC	Damp proof course

Documents

1.3 DOCUMENTS

The following documents are specifically referred to in this section:

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

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Manufacturer/supplier contact details

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

1.5 SPECIFIC DESIGN DOCUMENTS

Specific design documents relating to this part of the work:

Document:	Producer statement (design), buildable truss layout, truss design statement

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 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

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Compliance Information

1.9 COMPLIANCE - PRODUCER STATEMENT DESIGN

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

2 PRODUCTS

Materials

2.1 MITEK PREFABRICATED TIMBER TRUSSES

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

Components

2.2 MITEK GANG-NAIL TOOTHED CONNECTOR PLATES

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

Accessories

2.3 LUMBERLOK TIMBER CONNECTORS

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

2.4 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber:	18% maximum

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

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

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3.6 INSTALLATION ROOF TRUSSES

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

3.7 ROOF BRACING

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

3.8 SEPARATION

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

Completion & Commissioning

3.9 COMPLETION MATTERS

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

4 SELECTIONS

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

4.1 MITEK (GANG-NAIL) ROOF TRUSSES

Brand:	MiTek® (GANG-NAIL®) prefabricated timber roof trusses
Fabricator:	Accredited MiTek fabricator
Truss type:	Standard Trusses
Timber species:	Radiata pine
Timber grade:	SG8
Timber treatment:	H1.2 (standard)
Connector material:	Zinc coated steel

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3813F FUTUREBUILD® NZ - LVL STRUCTURAL FRAMING

1 GENERAL

This section relates to the supply and installation of Futurebuild® LVL engineered laminated veneer lumber structural members.

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:

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:

AS/NZS 2269.0	Plywood - Structural - Specifications
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specifications

1.3 MANUFACTURER DOCUMENTS

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

Futurebuild LVL Residential Design Guide (August 2022)
Futurebuild LVL Specific Engineering Design Guide (August 2019)
HyJOIST Installation Guide (August 2023)
designIT for Commercial Floors Installation Guide (September 2019)
Product Technical Notes & Information Bulletins
Product BPIS - Generic/Specific Design

Manufacturer/supplier contact details

Company:	Carter Holt Harvey LVL Ltd
Trading as:	Futurebuild LVL
Web:	www.futurebuild.co.nz
Email:	info@futurebuild.co.nz
Telephone:	0800 808 131

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.

2 PRODUCTS

Materials

2.1 HYONE

90mm thick structural LVL member with high stiffness manufactured from Type A bonded radiata pine veneers to AS/NZS 4357.0. H1.2 treated to NZS 3640. Available in a range of depths. Refer to SELECTIONS.

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2.2 HYSPAN

45mm, 63mm and 90mm thick structural LVL members manufactured from Type A bonded radiata pine veneers to AS/NZS 4357.0. H1.2 treated to NZS 3640. Available in a range of depths. Refer to SELECTIONS.

2.3 HYCHORD

45mm thick structural LVL member for high load applications manufactured from Type A bonded radiata pine veneers to AS/NZS 4357.0. H1.2 treated to NZS 3640. Available in a range of depths. Refer to SELECTIONS.

2.4 HY90

45mm and 90mm thick structural LVL members manufactured from Type A bonded radiata pine veneers to AS/NZS 4357.0. H1.2 treated to NZS 3640. Available in a range of depths. Refer to SELECTIONS.

Components

2.5 STEEL STRAPS

Mild steel galvanized straps. Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install LVL structural members plumb and true to line and face in accordance with Futurebuild LVL installation and design guides.

3.6 BEAMS/BEARERS & LINTELS

Prop beams/bearers and lintels greater than 3 metres in length at the mid-span until the building is closed in and the lintel is dry and protected from the weather.

Completion & Commissioning

3.7 COMPLETION MATTERS

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

4 SELECTIONS

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

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3820 CARPENTRY

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

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

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

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

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

1.3 QUALIFICATIONS

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

1.4 DIMENSIONS

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

2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

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

2.2 LAMINATED TIMBER

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

2.3 ENGINEERED WOOD

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

Treatment to NZS 3640 and AS/NZS 1604.1.

2.4 TIMBER TRUSSES

To FTMA CoP. Moisture content 16% at supply.

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2.5 WALL DWANGS, NOGS AND BLOCKING

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

2.6 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

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

2.7 EXTERIOR CAVITY WALL BATTENS - PROPRIETARY - NON-STRUCTURAL

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

Components

2.8 NAILS

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

2.9 SCREWS

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

2.10 BOLTS AND COACH SCREWS

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

2.11 NAIL PLATES

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

2.12 CONNECTORS

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

2.13 CORROSION RISKS

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

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

2.14 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

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3 EXECUTION

3.1 EXECUTION GENERALLY

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

3.2 SEPARATION

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

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

3.3 ATTENDANCE

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

3.4 MOISTURE CONTENT

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

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

3.5 SET-OUT

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

3.6 FRAMING WALLS

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

3.7 FRAMING ROOFS

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

3.8 FRAMING CEILINGS

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

3.9 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.10 FIT CAVITY BATTENS

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

3.11 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.12 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

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4 SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.2 ROOF FRAMING - RADIATA PINE

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

4.3 INTERIOR FRAMING - RADIATA PINE

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

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3821M MITEK TIMBER FRAMING

1 GENERAL

This section relates to the supply and erection of timber framing:

- as a framed structure
- as a partitioning system
- with **MiTek® (GANG-NAIL®)** timber/composite, lintels, beams, joists, rafters
- with **MiTek® LUMBERLOK®** timber connectors
- with **MiTek® BOWMAC®** structural brackets

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

SG	Structural grade (to NZS 3604, 1.3 **Definitions)**

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2904	Damp-proof courses and flashings
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3631	New Zealand timber grading rules
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4347	Damp-proof courses and flashings - Methods of test
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry.
BRANZ BU 673	Cavity battens
CodeMark™ CMNZ70024 ver6	MiTek LUMBERLOK® Timber Connectors

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

MiTek® (GANG-NAIL®) GANGLAM Manual
MiTek® (GANG-NAIL®) FLITCH BEAM Manual
MiTek® Structural fixings on-site guide for Building Code compliance 2024 edition - references NZS 3604:2011 B1 & B2 NZBC.
MiTek® LUMBERLOK® Floor Joist Stiffener

Manufacturer/supplier contact details

Company:	**MiTek New Zealand Limited**
Web:	www.miteknz.co.nz
Email:	design.miteknz@mii.com
Telephone:	0800 464 835

Requirements

1.4 QUALIFICATIONS

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

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1.5 NO SUBSTITUTIONS

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

Compliance information

1.6 COMPLIANCE - CODEMARK CERTIFICATE

MiTek LUMBERLOK timber connectors meet the requirements of the NZBC when used within the conditions and limitations of CodeMark Certificate of Conformity CMNZ70024 ver6.

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importer's or distributors warranty
- Installer's / applicator'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 - Wind and Bracing (design by contractor)

1.8 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

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

1.9 DESIGN PARAMETERS - BRACING

Design the system and its anchorages/fixings to the manufacturer's requirements and to resist the loads as appropriate for the projects wind zone and earthquake zone stated in the general section 1220 PROJECT.

2 PRODUCTS

Materials

2.1 DIMENSIONS

All timber sizes except for roof battens and other non-gauged timber are actual minimum dried sizes.

2.2 TIMBER FRAMING, TREATED

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

2.3 APPEARANCE TIMBERS

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

2.4 STRAPPING

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

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

2.5 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

To NZBC E2/AS1. H3.1 Radiata pine battens, 20mm thick, 45mm minimum width, and height to match timber framing studs. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.6 MITEK (GANG-NAIL) GANGLAM® COMPOSITE TIMBER BEAMS AND LINTELS

MiTek® (GANG-NAIL®) GANGLAM® comprising two timber sections, one on top of the other which are connected by GANG-NAIL® toothed connector plates.

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2.7 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

2.8 NAILS

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

2.9 BOLTS AND SCREWS

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

2.10 CONNECTORS

MiTek® LUMBERLOK® timber connectors (timber to timber, timber to concrete, timber to steel) to suit application to NZS 3604.

2.11 BRACING

MiTek® LUMBERLOK® bracing connectors, angle bracing or strlp bracing to suit application to NZS 3604; section 8, Walls and section 10, Roof Framing.

2.12 HANGERS

MiTek® LUMBERLOK® brackets and hanger connectors.

2.13 TIE DOWN, STRAPS AND TIES

MiTek® LUMBERLOK® tie downs, straps and ties to suit application to NZS 3604; section 7, Floors and section 10, Roof framing.

2.14 STRUCTURAL BRACKETS

MiTek® BOWMAC® brackets and hanger connectors.

2.15 GENERAL FIXINGS

MiTek® LUMBERLOK® general fixings including **MiTek® LUMBERLOK®** Nailon Plates to suit application to NZS 3604.

2.16 THREADED RODS

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

2.17 POWDER ACTUATED FASTENERS

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

2.18 CORROSION RISKS

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

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

3 EXECUTION

Conditions

3.1 PROTECT TIMBER

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

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3.2 EXECUTION

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

3.3 SEPARATION

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

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

3.4 FRAMING MOISTURE CONTENT

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

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

3.5 TOLERANCES

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

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

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

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

Application

3.6 SET-OUT

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

3.7 SET TIMBERS

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

3.8 TIMBER CUTTING

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

3.9 TIMBER PLATES AND FURRING

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

3.10 HOLES AND NOTCHES

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

3.11 CUTTING

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

3.12 EXPOSED TIMBER CONNECTORS AND FIXINGS

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

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3.13 POWDER-ACTUATED FASTENING TOOLS

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

3.14 ADDITIONAL FRAMING

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

3.15 FORM NAILED JOINTS

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

3.16 FORM BOLTED JOINTS

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

3.17 FIT CONNECTORS AND FIXINGS

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

3.18 FIT MITEK (GANG-NAIL) GANGLAM BEAMS

Fit and fix MiTek® (GANG-NAIL®) GANGLAM® beams to the requirements of MiTek® and to NZS 3604.

3.19 FIT BRACING

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

3.20 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.21 CLEAN UP

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

3.22 LEAVE

Leave work to the standard required by following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

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4 SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

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

4.2 ROOF FRAMING - RADIATA PINE

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

4.3 INTERIOR FRAMING - RADIATA PINE

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

4.4 CEILING FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Ceiling joists:	Radiata pine	SG8	H1.2
Timber ceiling battens:	Radiata pine	SG8	H1.2
Proprietary ceiling battens	GIB RONDO	310 35mm x 40mm	

4.5 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section



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4121SB SIKA® BLACKSEAL® ELASTIC

1 GENERAL

This section relates to the supply and application of the Sika® Blackseal® Elastic system, applied as a below ground flexible bitumen damp-proof membrane behind masonry and concrete walls. It is applied in liquid form.

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:

BRANZ	Building Research Association New Zealand

Documents

1.2 DOCUMENTS

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

ISO 9001	Quality management systems
ISO 11600	Building construction - jointing products

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Sika® Product Data Sheets and Safety Data Sheets:
Sika® Blackseal® Elastic
Sika® SealTape B
Sikalastic®-152
SikaSeal®-173
Sika® Primer -3 N
Sikaflex® PRO-3 Purform®
Sikaflex® AT Façade
Sika BlackSeal® Protection Sheet

BRANZ Appraisal 770 (2023) - Sika Blackseal Elastic Damp Proof Membrane - Amended 9 January 2025

Manufacturer/supplier contact details

Company:	Sika (NZ) Ltd
Web:	https://nzl.sika.com/
Email:	info@nz.sika.com perrett.jeff@nz.sika.com
Telephone:	0800 745 269
Facsimile:	0800 745 232

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For products listed in this section

- Refer to Sika for full terms of Warranty
- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

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Requirements

1.5 QUALIFICATIONS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved by Sika (NZ) Ltd. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.7 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: -

- Applicator 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.

2 PRODUCTS

Materials

2.1 SIKA® BLACKSEAL® ELASTIC

A polymer modified, water based, one component, brush applied, bitumen emulsion formulated for use as a damp-proofing membrane behind concrete and masonry retaining walls. Manufactured under ISO 9001. Refer BRANZ Appraisal 770.

Components

2.2 SIKA MONOTOP® REPAIR MORTARS

A range of patching and reprofiling mortars for use on concrete and masonry substrates. Contact Sika for further advice and information.

2.3 SIKA® SEALTAPE B

A self-adhesive, flexible waterproofing tape, with a textured top surface that will allow liquid membranes to adhere to it.

2.4 SIKALASTIC® -152

A cementitious, flexible, fibre-reinforced, brush applied waterproofing membrane, which can be applied as part of the sealing system for Sika® membranes, where they terminate on the exterior wall at ground level.

2.5 SIKASEAL®-173

A one component, bitumen based construction sealant used for sealing substrates that are bitumen based, or will be in contact with bitumen. E.g. Bitumen roofing and tanking membranes.

2.6 SIKA® PRIMER -3 N

A one component solvent based primer for porous substrates, applied before the application of Sikaflex sealants and adhesives.

2.7 SIKAFLEX® PRO-3 PURFORM®

A one component moisture curing polyurethane joint sealant with a movement capacity of +/-35%, with good chemical and mechanical resistance. Conforms to ISO 11600 Type F, Class 25HM.

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2.8 SIKAFLEX® AT FACADE

A one component, moisture-curing, low-modulus elastic sealant for porous and non-porous substrates, with a movement capacity of +/-25%. Conforms to ISO 11600 Type F, Class 25HM.

2.9 SIKA BLACKSEAL® PROTECTION SHEET

A rot proof, profiled, thermoplastic sheet to protect below ground waterproofing systems from damage during backfilling and compaction / settlement of backfill.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

Store in a dry place below 35°C and away from frost.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 WEATHER CONDITIONS

Apply only in fair weather with ambient and substrate temperature above 10°C and below 30°C. Protect from rain and water until fully dry.

Application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Preparation

3.6 PREPARATION - CONCRETE & MASONRY WALLS

Determine the ground level termination point for the Sika® Blackseal® Elastic and mark on the wall.

Thoroughly clean the masonry or concrete surface to be coated by removing all dirt, dust, grease, release agent and curing compound residues, by water blasting, grit blasting, or mechanical brushing.
Grind back and make smooth any dags, rough patches, sharp edges, or ridges.
Fill any surface irregularities e.g. holes, gaps and honeycombing, with appropriate patching and repair mortars from the Sika Monotop® range to make it smooth.

Grind back or fill any surface irregularities or overhangs at the connection between the wall and the footing, to make a flush, smooth and continuous vertical surface between the two.
Finish Concrete Surfaces to F4 finish, and firmly point masonry blockwork to give a flush finish.

3.7 PREPARATION – HORIZONTAL SURFACES

Re-profile all horizontal surfaces / toes protruding at the base of the wall / footing with Sika Monotop® 352 N mortar, to create a fall of not less than 1.5 degrees, to ensure that water will not pond on top of the finished membrane, and will fall away from the wall into the drainage system.

3.8 PREPARATION – EXTERNAL AND INTERNAL CORNERS

Grind back external corners to form a radius with a minimum diameter of 10mm, cove internal corners with a 10mm minimum bead of SikaSeal®-173 sealant.

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3.9 PREPARATION - CONTROL JOINTS UP TO GROUND LEVEL

Before Sika® Blackseal® Elastic is applied over any control / movement joints within the masonry / concrete wall, clean, prepare and prime the joints with Sika® Primer -3 N. Fill the joints with Sikaflex® PRO-3 Purform® or Sikaflex® AT Facade in accordance with the relevant product data sheet.

After the Sikaflex® has cured apply barrier tape Sika® SealTape B centrally over the joint to act as a separation layer between the sealant and the membrane. Run the tape to the top of the membrane and terminate at the pre-defined ground level.

3.10 PREPARATION – MEMBRANE TERMINATION POINT AT GROUND LEVEL

Determine the finished ground-level termination contour and mark it on the wall before commencing membrane application.

Brush apply a 300mm wide band of Sikalastic®-152 on to the wall in two layers, centred along the termination line, to achieve a finished thickness of approximately 3mm.

Application of Membrane

3.11 SUBSTRATE PRIMING

Apply a primer coat of 1-part clean potable water to 1-part Sika® Blackseal® Elastic to the clean and dry substrate, with a good quality, soft bristled, brush or roller, at a uniform rate of approximately 4m² / litre.

3.12 APPLICATION OF TOPCOATS

After the primer has fully dried, apply two undiluted coats of Sika® Blackseal® Elastic, using a good quality, soft bristled, brush or roller, at a rate of 2m²/litre/coat.

Appy the first coat and lay off in a horizontal direction, and once cured, apply the second coat and lay off in a vertical direction.
Allow a minimum of 4 hours curing between the first and second coats. Ensure that the first coat is fully dry before proceeding with the second coat. Full cure of the coats will be weather dependent. Protect each coat from rain or water until the completed system has fully cured.

3.13 MEMBRANE CONNECTION TO UNDERFLOOR DPM

Apply a 100mm wide strip of Sika® SealTape B along the top face of the DPM, with an equal overlap onto the DPM and the clean, dry concrete, using a pressure roller to remove any trapped air.

Apply two coats of Sika® Blackseal® Elastic over the tape to provide a continuous connection between the wall membrane and under footing DPM.

3.14 WALL MEMBRANE TERMINATION AT GROUND LEVEL

Apply two coats of Sika® Blackseal® Elastic up to a level 150mm below the top edge of the pre-applied Sikalastic -152 termination membrane (i.e. up to the ground level termination line). This will enable the membrane to be hidden and protected from UV exposure once the ground level is established.

Any Sika® Blackseal® Elastic that remains permanently exposed above ground level after completion must be suitably UV protected.

Application - Backfilling against membrane

3.15 MEMBRANE INSPECTION BEFORE BACKFILLING

Inspect the entire surface of the completed membrane system and repair any damage or defects using appropriate Sika components before proceeding with the installation of the protection sheet and backfilling.

Sika® Blackseal® Elastic is not UV resistant and should not be left exposed to sunlight.

3.16 WALL PROTECTION, DRAINAGE AND BACKFILLING

Protect Sika® Blackseal® Elastic immediately after full curing with the installation of Sika BlackSeal® Protection Sheet to the entire surface area of the membrane.

Use SikaSeal®-173 as an adhesive to hold the sheets temporarily in place against the membrane before backfilling.

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Allow a one row overlap at each sheet interface to provide continuity between the sheets and stop backfill from getting behind the sheets. Face the dimple side of the sheet towards the structure, and the flat side towards the backfill material.

Commence backfilling and compacting in accordance with the designer / engineer's instructions and avoid damaging or moving the protection sheet during the process.

Completion & Commissioning

3.17 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 SIKA® BLACKSEAL® ELASTIC SYSTEM - VERTICAL SURFACES

Supplier:	Sika (NZ) Ltd
Membrane type/brand:	Sika® Blackseal® Elastic
Components:	SikaSeal®-173 Sika MonoTop® Sika® Primer -3 N Sikaflex® PRO-3 Purform® Sikaflex® AT Façade Sika® SealTape B Sikalastic®-152 Sika BlackSeal® Protection Sheet

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4161 UNDERLAYS, FOIL AND DPC

1 GENERAL

This section relates to the application of:

- DPC/DPM
- wall underlays includes Kraft based and synthetic wall underlays
- roofing underlays includes kraft based and synthetic roof underlays

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

NZMRM	New Zealand Metal Roofing Manufacturers Inc.
W2	Wall underlay Kraft/bituminous based Heavy grade
W3	Wall underlay Synthetic based non-absorbent
W4	Wall underlay Synthetic based absorbent
R1	Roof underlay Kraft/bituminous based Heavy grade
R2	Roof underlay Kraft/bituminous based Self-supporting
R3	Roof underlay Synthetic based Heavy grade
R4	Roof underlay Synthetic based Self-supporting

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

The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZS/AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
AS/NZS 4200.1	Pliable building membranes and underlays
AS/NZS 4347.0	Damp-proof courses and flashings - Methods of test - General introduction, list of methods and test specimen requirements
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

Requirements

1.3 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the NZMRM CoP NZ Metal Roof and Wall Cladding Code of Practice.

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2 PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

Polyethylene film to AS/NZS 2904 and to the appropriate test methods set out in AS/NZS 4347.0. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings to doors and windows.

DPM

2.2 DAMP PROOF MEMBRANE - CONCRETE FLOOR

Polyethylene sheet with minimum thickness of 0.25mm to NZS 3604, 7.5.6, **Polyethelene (polythene) sheet damp-proof membranes**.

Wall Underlays

2.3 ABSORBENT SYNTHETIC WALL UNDERLAY - POLYPROPYLENE - FIRE (W4)

Absorbent, breathable, fire retardant, non-woven, white soft spun-bonded polypropylene membrane. Designed for use as fire retardant membrane, with Flammability Index of 1, when tested to NZS/AS 1530.2.

2.4 ABSORBENT SYNTHETIC WALL UNDERLAY - POLYOLEFIN - FIRE (W4)

Absorbent, breathable, fire retardant polyolefin (polyethylene) woven into sheet form with micro sized pores that allow the membrane to breathe with a fire retardant flammability index of 1, tested to NZS/AS 1530.2.

2.5 ABSORBENT SYNTHETIC WALL UNDERLAY - POLYPROPYLENE (W4)

Absorbent, breathable spun bonded polypropylene type building membrane, coated with a breathable water resistant film.

Roofing Underlay

2.6 SYNTHETIC NON-WOVEN SELF SUPPORTING ROOFING UNDERLAY (R4)

A non-woven self supporting roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs; with flammability index tested to NZS/AS 1530.2, AS/NZS 2295.

Accessories

2.7 WINDOW DOOR SEALING SYSTEM

Proprietary window and door flashing tape and accessories to NZBC E2/AS1, 4.2.12 Flexible flashing tape, and 9.1.4 Wall underlays to wall openings.

2.8 STUD STRAPS

19mm wide polyethylene straps, for cavity construction with framing centres greater than 450mm.

2.9 WIRE NETTING

75mm galvanized hexagonal wire netting to AS/NZS 4534.

2.10 SAFETY MESH

Galvanized or PVC coated safety mesh AS/NZS 4389.

2.11 GUTTER AND UNDER FLASHINGS

Bituminous breather type underlay cut to width by manufacturer for use under valley, apron flashing and internal gutters. Soffit liner cut to width from bituminous breather type underlay.

2.12 ADHESIVE TAPE

Adhesive tapes to compliment the underlay. Pressure sensitive tapes for joining foil insulation and vapour barriers.

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3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, and manufacturers technical literature.

Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

3.2 STORAGE

Store wall and roofing underlays and accessory materials, under conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture.

3.3 INSPECTION

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

Application - DPC

3.4 POLYETHYLENE DPC TO TIMBER

Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.5 DPC TO MASONRY AND BRICK VENEER

Lay DPC along base of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

3.6 DPC BETWEEN DISSIMILAR MATERIALS

Lay DPC between dissimilar materials where required.

Application - DPM

3.7 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand binding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier.

Application - Wall Underlay

3.8 WALL UNDERLAY

Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, 9.1.6 Wall underlay, and refer to manufacturer for requirement for fastenings. Fix to manufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

3.9 INSTALL STUD STRAPS

Over underlay, install 19mm wide polyethylene straps horizontally at 300mm centres, draw taut and fix to studs with stainless steel staples.

3.10 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix strip of underlay to face of batten before fixing the metal cladding.

Application - Roofing Underlay

3.11 INSTALL WIRE NETTING

Lay 75mm galvanized wire netting at right angles across the purlins and drawn taut before fixing. Tie edges of netting together with galvanized wire clips.

3.12 INSTALL SAFETY MESH

Lay and fix safety mesh to AS/NZS 4389.

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3.13 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based roofing underlays, 7 metres for fire retardant underlays and 20 metres for synthetic roofing underlays. Do not lay vertically on roof pitches under 10°.

Lay horizontally across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations. Avoid prolong exposure by installing the roof immediately. UV exposure to manufacturers requirements, maximum 7 days.

3.14 GUTTER AND UNDER FLASHINGS

Lay bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, internal gutters and soffit liner. Lap under flashings with adjoining underlays. Fix soffit liner from top plate down 150mm past ribbon plate.

Completion

3.15 CLEAN UP

Clean up as the work proceeds.

3.16 LEAVE

Leave work to the standard required by following procedures.

3.17 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 DPC

Brand / type: Thermakraft Supercourse 500 Damp proof course

4.2 DPM - CONCRETE FLOOR

Brand / type: Thermakraft Thermathene Black Damp proof membrane

4.3 WALL UNDERLAY

Brand / type: FPS Weathertight Eurotop N15

4.4 ROOFING UNDERLAY

Brand / type: Thermakraft Covertek 407

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4161FP FPS WEATHERTIGHT SYSTEM

1 GENERAL

This section relates to Frame Protection Systems Limited FPS® Weathertight® System roof and wall underlays.

It includes:

- Flexible underlays
- Tapes
- Penetration seals
- Components and accessories to complete installation

Documents

1.1 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 3602	Timber and wood-based products for use in building

CodeMark Certificate CMNZ70030 ver2 - FPS Weathertight System

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
FPS Technical Data Sheets
FPS Technical Manual - FPS Weathertight System - Version 1.3 September 2024

FPS Weathertight Building Underlay System Installation Guide 2024 - Version 1.3
Wall Installation Checklist for FPS Weathertight System - Version 1.1 April 2021
Roof Installation Checklist for FPS Weathertight System - Version 2.2 April 2021

Manufacturer/supplier contact details

Company:	Frame Protection System Limited
Trading as:	FPS Weathertight
Web:	www.frameprotection.co.nz
Email:	info@frameprotection.co.nz
Telephone:	0800 723 426

Requirements

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 NO SUBSTITUTIONS

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

Compliance information

1.5 CODEMARK CERTIFICATE

FPS Weathertight System meets the requirements of the NZBC when used within the Conditions and Limitations of Certificate CMNZ70030.

Performance - General

1.6 FLAMMABILITY INDEX

FPS Weathertight System underlays have a flammability index of ≤5, tested to AS 1530.2 in accordance with NZBC C/AS2.

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Quality control and assurance

1.7 INSTALLATION CHECKLIST

Complete FPS Weathertight Installation Checklist and make available to the contract administrator on request.

2 PRODUCTS

Materials

2.1 WALL & ROOF UNDERLAY - EUROTOP N15

115g/m², three-layer flexible polypropylene vapour permeable and waterproof wall and roof underlay, supplied in rolls 1.5m x 50m (75m²).

2.2 WALL & ROOF UNDERLAY - EUROTOP N35

135g/m², three-layer flexible polypropylene vapour permeable and waterproof wall and roof underlay, supplied in rolls 1.5m x 50m (75m²).

2.3 WALL UNDERLAY - EUROTOP W35

140g/m², three-layer flexible polypropylene vapour permeable and waterproof wall underlay, supplied in rolls 2.75m x 50m (137.5m²).

Components

2.4 STAPLES

9.5mm staples for Stinger manual feed and auto feed gun, and 16mm or 22mm staples for Stinger pneumatic staple gun. With proprietary staple caps.

2.5 FLASHING & SEALING TAPE

Euroband S, self-adhesive reinforced polyethylene tape in 25m long rolls with FPS application Squeegee:

60mm wide	for seam sealing and repairs
120mm wide	for flashing 90mm framing
180mm wide	for flashing 140mm framing

2.6 PENETRATION SEALS

FPS Weathertight penetration seals for pipe diameter 15mm - 165mm. Refer to SELECTIONS.

2.7 DOUBLE SIDED FOUNDATION AND EDGE TAPE

Euroband DS Black, double sided tape, 30mm wide x 30m rolls.

2.8 DOUBLE SIDED OVERLAP JOINING TAPE

Euroband DS Brown, double sided tape, 40mm wide x 50m rolls.

Components - wall/roof cavity

2.9 ROOF COUNTER BATTENS

H1.2 minimum treated, finger-jointed merchant grade Radiata pine battens, 20mm thick x 45mm width minimum. Refer to SELECTIONS.

2.10 COUNTER BATTEN FIXINGS

Countersunk screws, type, size and material being appropriate for its location and purpose. 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.

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3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 APPLICATION GENERALLY

Application in accordance with CodeMark CMNZ70030 and FPS Weathertight installation instructions and details. N15 and N35 underlays require minimum 2 people for application. W35 underlay requires minimum 3 people for application.

3.6 APPLICATION - TIMBER FRAMING MOISTURE CONTENT

FPS Weathertight System can be applied to timber framing that has been exposed to weather and is damp/wet. Moisture testing to be completed after application of FPS Weathertight System and prior to commencement of internal work and linings.

3.7 WINDOW AND DOOR OPENINGS

Apply underlay over window and door openings and leave uncut until joinery units are to be installed. Larger opening such as garage doors require temporary support of underlay.

3.8 EXPOSURE TO WEATHER

Complete installation of cladding within 90 days of commencement of FPS Weathertight System installation.

Application - wall underlay

3.9 MARK UPPER FIXING LINE - N15/N35

Commencing from bottom of wall, measure and mark upper fixing line across nogging using a chalk line, allowing bottom of underlay to sit 35mm minimum below the bottom plate for concrete foundations or terminate at bottom of boundary joist for timber foundations.

3.10 FIX TOP EDGE - N15/N35

Unroll underlay with branded face outwards and top edge on the upper fixing line. Pull underlay taut across framing and fix top edge at 250mm - 300mm horizontal spacings within 60mm of top edge using plain/bare staples/screws without caps.

3.11 MEASURE AND CUT UNDERLAY - W35

Commencing from bottom of wall, measure and cut underlay with top edge covering top plate and allowing bottom of underlay to sit 35mm minimum below the bottom plate for concrete foundations or terminate at bottom of boundary joist for timber foundations.

3.12 FIX TOP EDGE - W35

Position underlay with branded face outwards and top edge covering top plate. Pull underlay taut across framing and fix into top plate at 250mm - 300mm horizontal spacings using plain/bare staples/screws without caps.

3.13 FIX INTERNAL CORNERS

Push underlay into corner without cutting the corner and fix on either side of corner.

3.14 FIX UNDERLAY - GENERALLY

Fix using staples/screws with caps generally. Fix using plain/bare staples/screws without caps where fixings are to be covered by cavity battens.

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3.15 FIX UNDERLAY - N15/N35

Commencing from middle of wall length, pull bottom edge of underlay down flat and taut against framing. Working across and down, fix underlay to studs and nogs at spacings in accordance with installation manual fixing spacing table, keeping underlay taut and flat across framing. Continue with next layer of underlay above, overlapping previous layer by 60mm minimum. Overlap any vertical seams by 60mm minimum.

3.16 FIX UNDERLAY - W35

Commencing from middle of wall horizontally, pull bottom edge of underlay down flat and taut against framing. Working across and down, fix underlay to studs and nogs at spacings in accordance with installation manual fixing spacing table, keeping underlay taut and flat across framing. Overlap any vertical seams by 60mm minimum.

3.17 TAPE SEAL UNDERLAY

Seal underlay to concrete foundation/boundary joist using Euroband DS Black double-sided tape. Seal all horizontal seams using Euroband DS Brown double-sided tape. Seal all vertical seams using Euroband S 60 tape. Cover all bare staples/screws and repair all holes, rips, tears and punctures using Euroband S tape.

3.18 PREPARE WINDOW AND DOOR OPENINGS

Where timber framing has been exposed to weather and is wet at time of underlay application, cut 200mm long strips of underlay, width to match framing, and push 1 strip into each internal corner of opening and staple fix to framing.

3.19 FORM WINDOW AND DOOR OPENINGS

Cut underlay at 45º from each corner towards the opening mid-point. Trim and fold each flap into the opening and fix to inner face of the framing.

3.20 TAPE SEAL WINDOW AND DOOR SILL/HEAD

Cut a 75mm minimum length of Euroband S tape and cut into 2 pieces on the diagonal. Position wide end of tape piece onto vertical face of wall underlay at each sill corner and fold pointed end into corner, pressing firmly in place. Measure 200mm up from each corner of the opening and mark. Cut a 400mm length of tape and align top of the tape with the mark, and the side of the tape with the internal edge of the opening. Using provided squeegee, press the tape down into the corner and across the sill, removing any air bubbles. Cut overhanging tape at the corner and fold down onto the outside face of the wall underlay. Repeat for opening head corners.

Application - penetration seals

3.21 FIT PENETRATION SEALS

Position seal over penetration, with seal edges oriented at 45º to the face of the underlay. Tape seal all edges of penetration seal to face of underlay using Euroband S 60 tape.

Completion & Commissioning

3.22 COMPLETION MATTERS

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

3.23 COMPLETION - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements at completion. Complete frame moisture test prior to commencement of internal work/lining, timber moisture content to NZS 3602. Provide results to contract administrator.

4 SELECTIONS

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

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Materials

4.1 FPS WEATHERTIGHT SYSTEM - WALL UNDERLAY

Supplier:	FPS Weathertight
Foundation sealing tape:	Euroband DS Black
Horizontal seam sealing tape:	Euroband DS Brown
Vertical seam sealing tape:	Euroband S 60



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

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

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

The following definitions apply specifically to this section:

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

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

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

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Thermakraft's Product Data Sheets
Thermakraft's Installation Guides
BRANZ Appraisal 329 (2022) - Supercourse 500 Damp-Proof Course and Concealed Flashing - Amendment 29 August 2023
BRANZ Appraisal 651 (2024) - Thermakraft Covertek 407 Roof and Wall Underlay - Amended 13 July 2026
BRANZ Appraisal 695 (2023) - Watergate Plus Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 743(2025) - Thermakraft Covertek 405 Roof and Wall Underlay
BRANZ Appraisal 878 (2025) - Thermakraft Aluband Window Flashing Tape
BRANZ Appraisal 912 (2021) - Thermakraft 220 Synthetic Wall Underlay - Amended 01 July 2025
BRANZ Appraisal 917(2025) - Thermakraft Covertek 403 Roof and Wall Underlay
BRANZ Appraisal 942 (2022) - OneSeal Multi-fit Pipe and Cable Penetration Seals - Amended 28 July 2026
BRANZ Appraisal 943 (2021) - Thermakraft Covertek 401 Roof and Wall Underlay - Amended 01 July 2025

BRANZ Appraisal 1000 (2023) - Thermakraft Thermabar 397 Light Diffusing Reflective Underlay - Amended 01 July 2025
BRANZ Appraisal 1029 (2023) - Thermakraft Ausnet Hexagonal Wire Mesh
BRANZ Appraisal 1104 (2020) - Thermathene Orange Concrete Underlay - Amendment 06 September 2024
BRANZ Appraisal 1122 (2026) - Thermaflash Flashing Tape
BRANZ Appraisal 1229 (2023) - Thermakraft Covertek 215 Roof Underlay - Amended 19 June 2025
BRANZ Appraisal 1277 (2025) - Thermakraft RainArmor Self Adhesive Roof Underlay and Wall Underlay

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	For Kingspan Thermakraft product range.

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information - CodeMark certified

1.7 CODEMARK CERTIFICATE - THERMAKRAFT COVERTEK 407

Thermakraft Covertek 407 roof and wall underlay and Covertek 407 Early Close Wall Application meet the requirements of the NZBC when used within the conditions and limitations of its CodeMark Certificate of Conformity CMNZ30028.

Compliance information - BRANZ appraised

1.8 BRANZ APPRAISED - THERMAKRAFT SUPERCOURSE 500

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

1.9 BRANZ APPRAISED - THERMAKRAFT COVERTEK 407

Thermakraft Covertek 407 roof and wall underlay has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 651

2 PRODUCTS

DPC

2.1 THERMAKRAFT SUPERCOURSE 500

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

DPM

2.2 THERMAKRAFT THERMATHENE BLACK

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

Synthetic underlays - fire retardant

2.3 THERMAKRAFT COVERTEK 407

CodeMark certified and BRANZ appraised self-supporting synthetic roof and wall underlay, white with red logo print, composed of a water resistant vapour permeable film laminated to two layers of non-woven, spun bonded polyolefin sheet. Fire retardant, tested to AS 1530.2 and assigned a Flammability Index of ≤5. Available in 1250mm, 2550mm and 2740mm width. Suitable for use as an Early Close Wall Application providing up to 120 days temporary weather protection. Suitable for use as temporary weather protection for up to 30 days on roofs.

Components - sealing

2.4 THERMAKRAFT WHITE GENERAL PURPOSE TAPE

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

Fixings

2.5 FIXINGS - TO TIMBER

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

2.6 FIXINGS - TO STEEL

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

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

Installation - DPC

3.5 INSTALL DPC

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

Installation - DPM

3.6 INSTALL DPM - CONCRETE FLOOR

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

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3.7 APPLY TAPE TO LAPPED DPM JOINTS

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

Installation - roof underlay

3.8 INSTALL ROOF UNDERLAY - HORIZONTAL

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

3.9 INSTALL ROOF UNDERLAY - VERTICAL

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

Completion

3.10 COMPLETION MATTERS

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

4 SELECTIONS

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

DPC

4.1 DPC - THERMAKRAFT SUPERCOURSE 500

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

DPM

4.2 DPM - THERMAKRAFT THERMATHENE BLACK

Manufacturer:	Thermakraft
Brand:	Thermathene Black
Type:	Damp proof membrane
Width:	4000mm
Joint tape:	White General Purpose Tape

Synthetic underlays - fire retardant

4.3 ROOF & WALL UNDERLAY - THERMAKRAFT COVERTEK 407

Manufacturer:	Thermakraft
Brand:	Covertek 407
Type:	Synthetic roof and wall underlay
Fixings:	Galvanized Little Grippers
Maximum UV exposure:	Walls - 120 days
	Roofs - 30 days

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4231HA JAMES HARDIE AXON™ PANEL CLADDING

1 GENERAL

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

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

LRV: Light Reflectance Value
CLD: Ceramic Low Density

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products-Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
AS/NZS 3837	Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter
NFPA 285:2019	Standard fire test method for evaluation of fire propagation characteristics of exterior wall assemblies containing combustible components

CodeMark Certificate CMNZ30165 - Axon™ Panel Cladding by James Hardie

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Axon™ Panel Timber Cavity Batten Technical Specification March 2024
Axon™ Panel Fixed to Hardie™ CLD™ Structural Cavity Batten Technical Specification March 2024
Axon™ Panel Direct Fixed Technical Specification March 2024
Hardie™ Flex Sheet technical specification
Fire and Acoustic Design Manual by James Hardie, May 2025
BRANZ Appraisal 1211 [2022] - Axon™ Panel Cladding
BRANZ Appraisal 1285 (2025) - James Hardie Fire And Acoustic Wall Systems - Amended 16 June 2026

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

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

1.6 SAFE WORKING

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

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

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

Performance - Wind

1.8 PERFORMANCE - WIND

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

Performance - Fire

1.9 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

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

2 PRODUCTS

Materials

2.1 WALL UNDERLAY

Refer to section 4161 UNDERLAYS, FOIL AND DPC.

2.2 EXTERIOR STRUCTURAL CAVITY BATTENS

Hardie™ CLD™ Structural Cavity Batten, 3000mm long, 70mm wide and 19mm thick manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2. James Hardie Axon™ Panel and Hardie™ CLD™ Structural Cavity Batten installed as per the James Hardie technical specification demonstrate compliance with requirements of NZBC Sections B1, B2 and E2. The battens have both faces and all edges presealed.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, with upstands.

2.4 AXON™ PANEL

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

2.5 AXENT™ TRIM

Hardie™ Axent™ Trim, 45mm, 70mm and 89mm wide x 19mm thick, manufactured from cellulose fibre reinforced cement to AS/NZS 2908.2.

Components

2.6 FASTENER TYPE

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

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

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

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

2.7 NAIL HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN FIXING - TIMBER FRAMING

Over flexible wall underlay:	65mm x 2.8mm RounDrive ring shank nail
Over 9mm RAB™ Board or where building height >10m:	75mm x 3.06mm RounDrive ring shank nail

2.8 NAIL - AXON™ PANEL FIXING TO HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Axon™ Panel fixings to Hardie™ CLD™ Structural Cavity Batten, as follows:

For wind pressure up to 3.2kPa:

- stainless steel C-25 'T' Head brad nail.

2.9 NAIL - AXON™ PANEL FIXING TO TIMBER CAVITY BATTEN

Over flexible wall underlay:	65mm x 2.8mm Hardie™Flex nails
Over RAB™ Board:	75mm x 3.15mm Hardie™Flex nails

2.10 NAIL - AXON™ PANEL DIRECT FIX

40mm x 2.8mm Hardie™Flex nails.

2.11 NAIL - AXENT™ TRIM

40mm brad nails.

Accessories

2.12 FLASHING TAPES - TIMBER CAVITY BATTEN

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

2.13 FLASHING TAPES - HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Polypropylene DPC under Hardie™ CLD™ Structural Cavity Batten internal corners. Refer to James Hardie® Axon™ Panel technical specification for selection of required width.

2.14 ALUMINIUM ACCESSORIES

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

2.15 ADHESIVE FOR HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Adhesive to be applied continuous 6mm thick bead(s) to the face of Hardie™ CLD™ Structural Cavity Batten to adhere the Axon™ Panel.

2.16 SEALANT

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

3 EXECUTION

Conditions

3.1 STORAGE

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

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3.2 HANDLING

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

3.3 SUBSTRATE

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

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

3.4 SEAL EDGES

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

3.5 SEAL CUT ENDS, HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Site cut batten ends to be between 20 - 45 degrees and sealed with Dulux 1 Step or Resene Quick Dry sealer prior to installation with the butt joint deflecting moisture to the exterior.

Application - generally

3.6 FIX WALL UNDERLAY

Refer to 4161 UNDERLAYS, FOIL AND DPC.

3.7 HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN - TIMBER FRAME

Apply 150mm wide strip of DPC vertically to internal corners over continuous air barrier. Fix battens to all studs over the wall underlay using 65mm x 2.8mm RounDrive ring shank nails at fixing centres as per James Hardie Axon™ Panel Fixed to Hardie™ CLD™ Structural Cavity Batten Technical Specification, Table 4: Hardie™ CLD™ Structural Cavity fixings. Refer to Table 6 for durability requirements of fixings.

3.8 PENETRATIONS AND FLASHINGS

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

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

Install Axon™ Panel cladding

3.9 PANEL LAYOUT

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

3.10 FASTENER - SIZE AND LAYOUT

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

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

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3.11 FIXING - DIRECT FIXED TO FRAME

Fix with 40mm x 2.8mm Hardie™ Flex nails. Fix sheet at 200mm centres at all sheet edges as well as all intermediate framing. Alternatively fix with ND50 brad nails at 150mm centres.

3.12 FIXING - AXON™ PANEL OVER HARDIE™ CLD™ STRUCTURAL CAVITY BATTEN

Apply continuous 6mm thick bead(s) of adhesive to the face of Hardie™ CLD™ Structural Cavity Batten to adhere the Axon™ Panel, and fix with C-25 brad nails at 150mm centres. Refer to Axon™ Panel technical specifications.

3.13 GUN NAILING

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

3.14 VERTICAL JOINT

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

3.15 HORIZONTAL JOINT

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

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

3.16 INTERNAL CORNER JOINT - HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Apply continuous 10mm beads of adhesive sealant to Hardie™ CLD™ Structural Cavity Battens. Seal site cut Axon™ Panel edges. Fix Hardie™ 9mm aluminium internal corner mould through Hardie™ CLD™ Structural Cavity Battens into framing. Position and fix Axon™ Panels through Hardie™ CLD™ Structural Cavity Battens into framing, fixings 18mm minimum from square edge of sheet in accordance with James Hardie Axon™ Panel Technical Specification details.

3.17 EXTERNAL CORNER JOINT - HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Install Hardie™ CLD™ Structural Cavity Battens in accordance with James Hardie Axon™ Panel Technical Specification details. Seal site cut Axon™ Panel edges. Position and fix Axon™ Panels and Hardie™ 9mm Aluminium External Box corner or Hardie™ Alumnium Invert External Corner over battens, fixing in accordance with James Hardie Axon™ Panel Technical Specification details.

3.18 EXTERNAL CORNER JOINT WITH H MOULD

Fit Hardie™ 9mm Panel aluminium horizontal 'h' mould over lower Axon™ Panel and lap the upstand under upper Axon™ Panel. Leave 15mm gap maximum between upper and lower Axon™ Panels at the solid timber floor joist levels.

Fit Hardie™ 9mm Panel aluminium external box corner under the aluminium 'h' mould with flanges removed locally. Mitre the 'h' mould over box corner flashing to cover it. Install "h" mould external corner jointer over. The upper box corner flashings are to be finished flush with the bottom edge of upper Axon™ Panel.

An aluminium corner flashing is required over the Hardie™ 9mm Panel aluminium horizontal flashing where the box corner is terminated under the 'h' mould. Hardie™ 9mm Panel aluminium external box corner flanges to be removed locally over the aluminium 'h' mould and corner underflashing to be lapped under the upper box corner flashing. Lap wall underlay over aluminium 'h' mould or seal to flashing with a flashing tape. Refer to Axon™ Panel technical specifications.

3.19 FIX AXENT™ TRIM

Fix Hardie™ Axent™ Trim to internal corners, external corners, vertical joints and intermediate vertical locations in accordance with James Hardie Axon™ Panel Technical Specification details.

3.20 FINISHING

Refer to painting section/s for protective coating system.



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Completion

3.21 REPLACE

Replace all damaged or marked elements.

3.22 LEAVE

Leave work to the standard required for following procedures.

3.23 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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

4.1 TIMBER CAVITY BATTENS

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

4.2 HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS - TIMBER FRAME

Brand/type:	Hardie™ CLD™ Structural Cavity batten
Thickness:	19mm
Fastener type:	65mm x 2.8mm RounDrive ring shank nails

4.3 JAMES HARDIE AXON™ PANELS - SHEET CLADDING PANELS

Brand/type:	James Hardie Axon Panel 133mm Grooved
Thickness:	9mm
Fastener type:	C-25 straight 'T' - Head stainless steel brad nail for wind pressure up to 3.2kPa ULS
Fastener finish:	316 Stainless Steel

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4231HI JAMES HARDIE EXTERNAL FIRE & ACOUSTIC WALL SYSTEMS

1 GENERAL

This section relates to the supply and installation of

- **James Hardie** two way, external/internal, fire and acoustic rated load bearing wall systems for timber and steel framed buildings.
- **James Hardie** two way fire rated parapet and wing walls.

Each system includes;

- framing
- cladding
- lining
- insulation
- underlay
- associated components and accessories necessary to complete the system

1.1 RELATED WORK

Refer to related James Hardie cladding section.

Refer to related framing section.
Refer to related insulation section.
Refer to 4161 UNDERLAYS, FOIL AND DPC for wall underlay
Refer to 5171G GIB® PLASTERBOARD FIRE & SOUND LININGS for fire rated and acoustic linings.

1.2 ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

FRR	Fire resistance rating
STC	Sound transmission class

Documents

1.3 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1530.2	Methods for fire tests on building materials, components and structures - Part 2: Test for flammability of materials
AS/NZS 1170.2:2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Part 5: Earthquake actions - New Zealand
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

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

Fire and Acoustic Design Manual by James Hardie, May 2025
Bracing Design Manual by James Hardie
GIB® Fire Rated Systems

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BRANZ Appraisal 1285 (2025) - James Hardie Fire And Acoustic Wall Systems - Amended 16 June 2026

Manufacturer/supplier contact details

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

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER OR SYSTEM

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie products
15 years:	For accessories supplied by James Hardie (refer to James Hardie product warranty)
10 years	For all GIB® products and systems installation (refer to Winstone Wallboards product warranty)

- Provide warranty on the manufacturer's standard form/s.
- 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 SAFE WORKING

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

1.8 NO SUBSTITUTIONS

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

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

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

Performance

1.10 FIRE RATING REQUIREMENTS

Provide the James Hardie fire rated system. Refer to SELECTIONS for system FRR details.

1.11 SOUND INSULATION REQUIREMENTS

Refer to SELECTIONS for system details and required STC ratings.

Compliance information

1.12 COMPLIANCE - BRANZ APPRAISAL

James Hardie External Fire & Acoustic Wall Systems have been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of BRANZ Appraisal 1285.

2 PRODUCTS

Materials - general

2.1 TIMBER FRAMING

Refer to appropriate timber framing section.

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2.2 FLEXIBLE UNDERLAY

Flexible underlay that complies with NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays, with a flammability index not exceeding 5 when tested to AS 1530.2. Refer to the appropriate separate section(s).

2.3 RIGID AIR BARRIER

Refer to section 4171HR JAMES HARDIE RIGID AIR BARRIERS for RAB™ Board.

2.4 INSULATION - GLASS WOOL

Refer to the appropriate separate insulation section(s). Glass wool insulation minimum R2.2 and density 12-18 kg/m3

2.5 INSULATION - HARDIE™ MINERAL INSULATION

Hardie™ Mineral insulation, 90mm thick, R 2.74m²K/W, density 80kg/m3.

2.6 TIMBER CAVITY BATTENS

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

2.7 HARDIE™ HORIZONTAL TIMBER CAVITY BATTENS

Radiata pine battens as packers, minimum 45mm wide x 20mm thick with bevelled edge and purpose cut rebates for drainage and ventilation, H3.1 treated to NZS 3602, Table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.8 HARDIE™ CLD™ STRUCTURAL CAVITY BATTENS

Hardie™ CLD™ Structural Cavity battens, 70mm wide x 19mm thick and 2450mm long, fully sealed on all faces. Manufactured from treated cellulose fibre, Portland cement, sand and water. Cured by high pressure autoclaving and manufactured to AS/NZS 2908.2.

Components - cladding/lining

2.9 JAMES HARDIE FIBRE CEMENT CLADDING

Refer to SELECTIONS for type. Refer to relevant James Hardie cladding section.

2.10 NON JAMES HARDIE CLADDING

Refer to SELECTIONS and relevant cladding section.

2.11 GIB® PLASTERBOARD LINING

GIB Fyreline®, fire resistant plasterboard to AS/NZS 2588. Refer to 5171G GIB® PLASTERBOARD FIRE & SOUND LININGS for GIB Fyreline®. Refer to SELECTIONS for thickness.

2.12 FIXINGS - JAMES HARDIE CLADDING/LINING

Refer to Fire and Acoustic Design Manual by James Hardie system description, James Hardie product technical specification/installation manuals for its fixings.

2.13 POST FIRE STABILITY - ANCHOR

Pryda® Brace Anchor or GIB Handibrac® with Ramset Ankascrew M12 x 150mm for concrete and M12 x 150mm Coach screw for timber. Gib Quiet Tie for intertenancy walls.

2.14 FASTENER TYPE

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

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

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

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

Accessories

2.15 COATINGS AND FINISHES

Refer to relevant James Hardie technical literature for the cladding system selected.

2.16 FIRE RESISTANT COLLAR

Refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 FRAMING - GENERAL

Ensure framing sizes and set-out suit the selected fire and acoustic rated wall system, plumb, level and in true alignment.

Moisture content of timber framing: maximum to NZS 3602

3.5 TIMBER FRAMING - NZS 3604

Refer to appropriate TIMBER FRAMING section. Timber framing to NZS 3604 and selected James Hardie fire and acoustic system requirements.

3.6 TIMBER FRAMING - SPECIFIC ENGINEERING DESIGN

Refer to appropriate TIMBER FRAMING section. Timber framing to specific engineering design (SED) to AS/NZS 1170.2, NZS 1170.5 and NZS 3603 and to selected James Hardie fire and acoustic system requirements.

Application - general

3.7 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.8 BOUNDARY WALL - POST FIRE STABILITY

Ensure timber bottom plate and studs are fixed using Pryda® Brace Anchors or GIB Handibrac® on each side of the stud to James Hardie installation instructions.

3.9 SERVICE PENETRATIONS

Co-ordinate installation of fire collars and fire sealants with penetrations through fire rated walls in accordance with the technical information from the fire sleeve/collar supplier and James Hardie requirements.

3.10 HARDIE™ MINERAL INSULATION

Fit pre-cut Hardie™ Mineral Insulation tightly in framing cavities to achieve a tight friction fit. If cutting is required ensure that insulation is tightly fitted in each direction.

3.11 GLASS WOOL INSULATION

Refer to related insulation section.

3.12 FLEXIBLE UNDERLAY

Refer to the appropriate separate section(s).

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3.13 RIGID AIR BARRIER

RAB™ Board fixed to all framing with fixings at 150mm centres maximum and joints taped as per James Hardie HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

3.14 CAVITY CONSTRUCTION

Install to James Hardie cavity construction installation instructions for the specified cladding material. Cavity must not open into the roof space or subfloor space. Refer to Fire & Acoustic Design Manual by James Hardie construction details.

3.15 CONTROL JOINTS

Horizontal control joints in claddings to be provided at all floor joist levels to the relevant James Hardie product technical specification. Vertical control joints must be installed to James Hardie product technical literature.

3.16 CONTROL OF EXTERNAL FIRE SPREAD

Ensure flashings and continuous horizontal cavity battens are installed to James Hardie product technical literature, to prevent fire spread within the cavity.

3.17 JAMES HARDIE FIBRE CEMENT CLADDING/LINING LAYOUT AND FIXINGS - GENERAL

Refer to Fire and Acoustic Design Manual by James Hardie and Cladding technical specification for system fixing requirements.

3.18 NON JAMES HARDIE CLADDING LAYOUT AND FIXINGS - GENERAL

Refer to related CLADDING section.

3.19 GIB FYRELINE® LINING

Select GIB Fyreline® thickness in accordance with James Hardie fire rated system specification. Install the GIB Fyreline® products as per Winstone wall board technical literature.

3.20 STRUCTURAL STEEL MEMBERS IN FIRE RATED WALL

Independently fire rate structural steel members inside the fire rated wall cavity. Refer to appropriate STEELWORK FIRE RATED COATINGS section for intumescent paints.

Completion & Commissioning

3.21 COMPLETION MATTERS

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

3.22 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS

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

External timber framed fire & acoustic rated wall system

4.1 JAMES HARDIE FRR 30/30/30 SYSTEM - EXTERNAL TIMBER FRAMED WALL

Brand:	James Hardie Fire & Acoustic system
System #:	JHETGR30-N
FRR:	30/30/30
STC:	43
Lining type:	10mm GIB Fyreline®

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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® Hardie™ Flex Eaves Lining

Documents

1.1 DOCUMENTS

The following documents are specifically referred to in this section:

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

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

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

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

Manufacturer/supplier contact details

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

Requirements

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 NO SUBSTITUTIONS

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

Performance

1.5 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.

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Components

2.2 FASTENER TYPE

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

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

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

Components - Hardie™ Flex Eaves Lining

2.3 SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4 HARDIE™ FLEX NAILS

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

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 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Moisture content timber framing: 18% maximum

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.



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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.

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. 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

Brand/type:	James Hardie® Hardie™ Flex Eaves Lining
Thickness:	4.5mm
Width:	450mm, 600mm, 750mm - 4.5mm thick sheet (2400mm length)
Fixing Method:	Hardie™ Flex nails (usual fixing method).
Fixing type:	Stainless steel Hardie™ Flex Nail, 40 x 2.8mm
Joint detail:	Hardie™ Jointer 5mm for 4.5mm thick sheet.

Painting

4.2 PAINTING

Refer to painting section/s for details.

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4241 PROFILED METAL CLADDING

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS

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

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

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

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

Requirements

1.5 WARRANTY - INSTALLER/APPLICATOR

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

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

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

1.6 QUALIFICATIONS

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

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Performance

1.7 PERFORMANCE

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

1.8 SPREAD OF FIRE

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

Performance - Wind (design by contractor)

1.9 DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

Refer to general section 1220 PROJECT for details.

2 PRODUCTS

Materials

2.1 EXTERIOR CAVITY WALL BATTENS

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

2.2 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

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

2.3 GALVANIZED STEEL, UNPAINTED

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

2.4 ALUMINIUM/ZINC ALLOY COATED STEEL, UNPAINTED

Formability G550 steel sheet coated to AS 1397.

Coating class: AZ 150

2.5 PRE-FINISHED ALUMINIUM/ZINC ALLOY COATED STEEL

Formability G550 steel sheet coated to AS 1397.

Coating class: AZ 150

2.6 HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL, UNPAINTED

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

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

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

2.8 ALUMINIUM

5005 alloy H16 or H18 temper to suit application.

2.9 PRE-FINISHED ALUMINIUM

5005 alloy H16 or H18 temper to suit application.

2.10 STAINLESS STEEL

Strip grade 445M2.

2.11 COPPER

Half-hardened commercial finished.

2.12 ZINC

Natural pre-weathered zinc. Refer to SELECTIONS for surface finish.



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2.13 FASTENERS GENERALLY

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

2.14 FIXING CLIPS

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

2.15 FIXING SCREWS

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

2.16 RIVETS

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

Components

2.17 FLASHINGS GENERALLY

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

2.18 FLASHINGS

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

2.19 WALL AND PARAPET FLASHINGS

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

Accessories

2.20 SEALANT

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

2.21 CLOSURE STRIPS

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

2.22 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

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

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3.3 STORAGE

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

3.4 HANDLING

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

3.5 SEPARATION

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

Application

3.6 SET-OUT

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

3.7 AVOID END LAPS

End laps are not permitted, except where specifically detailed.

3.8 MOVEMENT JOINTS

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

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

3.9 FIXING GENERALLY

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

3.10 INSTALL DRAINED CAVITY

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

3.11 PENETRATIONS

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

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

3.12 MARKING AND CUTTING

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

3.13 FIX SHEETS

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

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3.14 INSTALL FLASHINGS

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

3.15 COMPLETE

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

3.16 SEPARATION

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

Completion

3.17 REPLACE

Replace all damaged or marked elements.

3.18 LEAVE

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

3.19 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 TIMBER CAVITY BATTENS

Timber species:	Radiata pine
Timber grade:	Merchantable
Treatment:	H3.1

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4241NZ COLORSTEEL® WALL CLADDING

1 GENERAL

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

1.1 RELATED WORK

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
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:

BPS	Building Product Specifications
NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
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
CodeMark™ CMNZ70050 ver2	Colorsteel® Dridex®

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 Altimate® Installation Guide
- COLORSTEEL Altimate® Design Guide
- COLORSTEEL Dridex® Design Guide
- COLORSTEEL Dridex® Installation 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

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Telephone: 0800 100523
Email: specifications@colorsteel.co.nz

Warranties

1.5 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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.7 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.

1.8 NO SUBSTITUTIONS

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

1.9 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.

Compliance Information

Performance - Fire

1.10 EXTERNAL FIRE SPREAD - NON-COMBUSTIBLE MATERIAL

Zincalume®, COLORSTEEL® Maxam™, COLORSTEEL® Maxam™ Dridex®, COLORSTEEL Altimate® and COLORSTEEL Altimate® Dridex® are manufactured from a non-combustible material with a surface finish no more than 1mm in thickness applied directly to the non-combustible substrate.

1.11 EXTERNAL FIRE SPREAD - CLADDING MATERIAL, CLASSIFICATION

COLORSTEEL® Maxam™ and COLORSTEEL® Maxam™ Dridex® have been tested to ISO 5660.1 and to specific requirements of NZBC C/AS1 or NZBC C/AS2 achieving:

Type A classification (peak heat release rate ≤ 100 kW/m², total heat release rate ≤ 25 MJ/m²).

1.12 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 BPS, 8.5.1 Group Numbers:

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

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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.

2.3 FIXING CLIPS - TRAY PROFILES

Metallic coated steel or stainless steel clips to suit the cladding material, profile and location as required by cladding profile manufacturer (roll-formers). Clip screw fixings to cladding profile manufacturer's fixing charts or Specific Engineered Design, minimum Class 3

2.4 FIXING SCREWS

Screws to AS 3566. Screws appropriate to the cladding material and the supporting structure, as required by cladding profile manufacturer (roll-formers) 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.

2.5 RIVETS

Sealed aluminium, minimum diameter 4.0mm.

Components

2.6 FLASHINGS GENERALLY

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

2.7 FLASHINGS

To NZBC E2/AS1, 4.0, Flashings.

Formable grade 0.55mm BMT for galvanized, aluminium/zinc-coated and pre-painted steel, to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

Flashings to framed penetrations to be in accordance with project drawings or to NZMRM CoP recommendations.

2.8 WALL AND PARAPET FLASHINGS

To NZBC E2/AS1, 4.0 Flashings.

Supplied by the cladding manufacturer to match or to suit the cladding.

2.9 EXTERIOR CAVITY WALL BATTENS

Refer to timber framing sections.

2.10 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Refer to timber framing sections.

Accessories

2.11 UNDERLAY

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.12 SEALANT

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

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2.13 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

2.14 SEPARATION STRIP TIMBER CAVITY BATTENS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Inspect the wall framing and supporting structure to ensure that it is complete and fully braced ready for cladding and free from any misalignments or protrusions that could damage the cladding.

Ensure moisture content is:
Timber framing: 18% maximum
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 SEPARATION

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

Application

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.6 METAL CLADDING ON TIMBER CAVITY BATTENS

Fix PVC tape or similar to the timber batten, prior to fixing metal cladding.

3.7 INSTALLATION GENERALLY

Install profiled metal cladding in accordance with NZMRM CoP and roofing profile supplier requirements, to form a weather-tight performance for the completed roofing system, including all junctions, flashing/cappings and penetrations through the roofing.

3.8 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:

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

3.9 SET-OUT FOR VERTICAL CLADDING

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

3.10 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets and flashings 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.

3.11 FIX SHEETS

Fix sheets in place using the fastening system required by the cladding 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.

3.12 THERMAL MOVEMENT

Fixing and jointing to conform with the cladding profile manufacturer's (roll-formers) requirements for thermal movement.

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

3.13 END LAPS

End laps are not permitted, except where specifically detailed.

3.14 FIXING GENERALLY

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

3.15 INSTALL FLASHINGS

Flash to penetrations, cap corners and edges, using sealant and rivets to detail Where no detail is provided flash to NZMRM CoP recommendations and the roofing manufacturer's and NZBC E2/AS1 requirements.

3.16 FLASHING PENETRATIONS

Flash all penetrations through the cladding as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

3.17 USE OF SEALANTS

Select and use sealants only as recommended by cladding manufacturer. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

Completion

3.18 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to www.colorsteel.co.nz and to selected cladding manufacturer's website.

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

Cladding

4.1 COLORSTEEL® MAXAM™ PROFILED CLADDING

Manufacturer:	New Zealand Steel
Material:	COLORSTEEL® Maxam™
BMT:	0.4mm

Accessories

4.2 FLASHINGS - GENERALLY

BMT/material:	0.55mm
Coating system:	To match roofing
Coating colour:	To match roofing

4.3 FLASHINGS - REQUIRING GREATER DURABILITY

BMT/material:	0.90 Aluminum
Coating system:	COLORSTEEL Altimate®
Coating colour:	To match cladding



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4284C SPECIALIZED CAVITECLAD EIFS CLADDING

1 GENERAL

This section relates to SPECIALIZED CONSTRUCTION PRODUCTS (**SCP**) Caviteclad exterior insulated wall cladding system with a plaster finish on 50mm and 75mm EPS, XPS and thermoset phenolic insulation sheets fixed to timber/metal framing on a drained/ ventilated cavity.

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

SCP	Specialized Construction Products
MPNZA	Master Painters New Zealand Association
EIFS	Exterior insulation and finishing system
EPS	Expanded polystyrene
LRV	Light reflective value
XPS	Extruded polystyrene

1.2 DOCUMENTS

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

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 1170.2:2011	Structural design actions - Wind loads
AS 1366.1	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polyurethane (RC/PUR)
AS 1366.3	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - moulded (RC/PS-M)
AS 1366.4	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Extruded (RC/PS-E)
AS/NZS 2311	Guide to the painting of buildings
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
NASH Building Envelope Solutions	Light Steel Framed Buildings
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
MPNZA	Heath and Safety Programme

Health and Safety at Work Act 2015

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

Caviteclad Installation Guide, Aug 2024
Caviteclad Specification, Aug 2024
BRANZ Appraisal 510 (2026) - Caviteclad Exterior Insulation and Finishing System
Materials and execution to Specialized Construction Products specification except where varied by this specification and supported by architectural detailing.

Copies of the above literature are available from:

Company:	Specialized Construction Products
Web:	www.specialized.co.nz
E-mail:	info@specialized.co.nz

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Telephone: 09 414 4499
Fax: 09 414 4489

Warranties

1.4 WARRANTY

SCP warrant this system under normal environmental and use conditions against failure of materials and execution. The plaster system is warranted as follows:

Materials: 15 years from date of practical completion issued by the manufacturer.
Execution: 5 years from the date of practical completion issued by the Certified Caviteclad contractor upon completion.

A warranty pack including a producer statement from the Certified Caviteclad contractor and a guarantee plaque to be adhered to the inside of the meter box for the project, must be made available by the Certified contractor at the date of practical completion.

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified SCP plaster system.

1.6 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Applicators to be certified by Specialized Construction Products. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide SCP maintenance instructions before practical completion of the contract for issuing to the building owner.

1.8 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 and risks is not possible then minimise hazards and risks 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 risks, and put into place procedures for dealing with emergencies. Obtain from SCP the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

Performance

1.9 PERFORMANCE

The Certified Caviteclad contractor must accept responsibility for the structural and weather-tight performance of the exterior render application.

1.10 PROTECTION OF NEW PLASTER

Confirmation of the protection systems to be applied to fresh plaster coats to be agreed between the main contractor and the Certified applicator before plastering begins.

1.11 INSPECTIONS

Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives from SCP to inspect the work in progress and to take samples of their products from site.

1.12 PRODUCER STATEMENT

Provide a producer statement compiled by the Certified Caviteclad contractor in the form as required by the Building Consent Authority.

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Performance - Wind (design by contractor)

1.13 DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

Refer to general section 1220 PROJECT for details.

Performance - Fire

1.14 EXTERNAL FIRE SPREAD - CLADDING EXEMPT FROM TESTING

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

2 PRODUCTS

Materials

2.1 75MM NEOPOR® EPS THERMASHELL SHEET

75 mm thick Class S expanded polystyrene (EPS), minimum density 16 kg/m³, manufactured to AS 1366.3. Sheets 0.6m wide x 2.4m long. R-value 1.29, thermal conductivity 0.032 W/m°C.

Base

Texture finishes

Top Coat Paint Finish

2.2 TOP COAT - DULUX ACRATEX 955 ACRASHIELD ADVANCE

Dulux AcraTex 955 AcraShield Advance, a 100% acrylic mid build, pigmented pure acrylic coating, available in matt and low gloss finishes. Suitable to be applied over cement-based plaster finishes as well as acrylic textured surfaces. Dry film per coat 75 microns. VOC < 85g/L. Refer to SELECTIONS.

Components

2.3 THERMASHELL SHEET FIXINGS, TIMBER FRAME

8g x 120 mm Class 4 hot-dip galvanised wood screws to AS 3566,with 42 mm diameter polypropylene washers.

2.4 EXTERIOR CAVITY POLY BATTENS

50 x 21mm high density expanded polystyrene battens.

2.5 CAVITY BATTEN FIXINGS - NAILS

2.5mm x 30mm hot-dip galvanized steel flat head nails.

2.6 REINFORCING MESH

Alkali-resistant fibreglass woven reinforcing mesh with a nominal size of 4mm x 4mm square and a weight of 160 g/m².

Accessories

2.7 FLASHINGS AND ACCESSORIES

Proprietary profiles made from rigid PVC for head, sill, and jamb flashings, lipped L-bead, 50mm U-channel, 70mm U-channel, 20mm x 20mm corner bead, 50mm x 20mm L-bead, flat U-channel and 50mm high back U-channels.

2.8 EXTERIOR CAVITY BASE BEAD

Proprietary cavity base bead made from rigid PVC. Base bead to have 3mm x 10mm slots to provide 1000mm² ventilation per linear metre.

2.9 FIXING BLOCKS

H3.2 timber blocks to match polystyrene thickness, for the fixing of outside fittings (eg. downpipes, hose taps, lights, etc).

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2.10 SEALANTS

Paintable MS sealant in accordance with SCP's guide and set against backer rods where necessary.

2.11 ADHESIVE

EPS compatible low solvent construction adhesive in accordance with the system manufacturer requirements.

2.12 THERMASHELL JOINT ADHESIVE

EPS compatible self-expanding, moisture cure polyurethane foam adhesive.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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 PLASTERING CONDITIONS

Carry out plastering to SCP's specifications under conditions which will not adversely affect the finished work.

3.4 PROTECT

Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean droppings off finished work immediately.

3.5 SUBSTRATE - TIMBER FRAMING

Do not commence work until the framing is of the standard required for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZBC E2/AS1 to minimise shrinkage and movement after the panels are fixed. Studs are not to exceed 600mm centres and nogs fitted flush at a maximum of 800mm centres. Wall underlay to comply with NZBC E2/AS1, Table C.2.1.1 Properties of roof underlays and wall underlays.

3.6 OPENINGS

Do not commence work until openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparations are complete. All defects in substrate must be rectified prior to application of plaster coatings. Ensure that backgrounds and adjoining surfaces are, after the preparation called for in this section, of SCP's required standard.

3.7 MASONRY AND CONCRETE SUBSTRATE

Where the cladding is detailed over the foundations down to ground level refer to SCP Detail Solutions. Clean all surfaces to receive direct bonded applications of Caviteclad. Smooth dense concrete surfaces to be slush coated before the application of the bonding plaster to ensure suitable adhesion is created. All porous surfaces to be sealed with Tankit waterproofing plaster before the application of the bonding plaster.

3.8 FLASHING AND DETAILING

Comply with NZBC E2/AS1, 4.0 Flashings, and SCP's penetration flashing guidelines. Carry out to the required standard of execution to ensure water does not penetrate.

3.9 CONFIRM LAYOUT

Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

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Application

3.10 INSTALLATION GENERALLY

To NZBC E2/AS1 and SCP installation instructions & details.

3.11 PENETRATIONS

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

- wall underlay to openings finished and dressed off with flexible flashing tape ready for the installation of window and door frames and other penetrations.
- installation of window and door joinery.
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- where electrical cables pass through cladding, put into conduit to ensure that there is no direct contact with the polystyrene.
- windows must be installed so a gap of 23mm to 24mm is provided from the back of the joinery to the front of the timber framing.
- all penetrations such as water pipes, ducting, light fittings, must be installed with a minimum of 5° outward slope and be sealed to the wall underlay by the contractor who installed them.

3.12 FLASHING AND ACCESSORIES

Fit flashings to jambs, sills and heads on recessed joinery using the manufacturer proprietary flashings. Reinforce external corners and bottom edges of the Neopor EPS sheets and Themashell panels with PVC angles and channel extrusions glued to the Neopor EPS sheets and Themashell panels with Sika Nailbond PB adhesive.

3.13 CAVITY BASE BEAD

As an alternative to the traditional lipped base beads that are typically used, 50mm high back PVC cavity base beads can be fixed to the bottom plate prior to any 50mm EPS being installed.

3.14 FIXING POLYSTYRENE CAVITY BATTENS

Fix polystyrene battens full length to studs to achieve a 20mm minimum thickness drained cavity to NZBC E2/AS1, 9.0 Wall claddings. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin proofing at base of wall, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens must be no longer than 100mm and fixed at a 5° slope. Fix additional battens to internal and external corners and around openings to SCP's standard details.

3.15 FIT 75MM NEOPOR® EPS THERMASHELL SHEETS

Fit 75mm Neopor® EPS Thermashell sheets oriented horizontally with vertical and horizontal joints bonded with Thermshell joint adhesive. Join vertical sheet edges on or off studs, staggered 200mm minimum each row. Provide fixings vertically at stud locations, through cavity battens and into the wall framing in accordance with SCP installation instructions. Provide fixings to horizontal sheet edges at soffits and window and door openings.

3.16 MOVEMENT CONTROL JOINTS

Incorporate in accordance with the design information supplied by SCP. Control joints to be positioned over solid timber backing and shall be provided on all walls over 20 metres in length or over 7 metres high, at abutments to different cladding types, where cladding covers structural materials, and over a movement joint in the underlying framing. Confirm locations in writing to the owner before work commences.

Application Base coat

3.17 PREPARE SURFACE

Flush fill all gaps between EPS sheets with adhesive spray foam. Remove oxidization on the surface of the EPS with a stiff broom and water, then scratch the surface to provide a key before plastering begins.

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Application Paint finish

3.18 APPLY TOPCOAT

Apply the specified number of coats of Dulux AcraTex 955 AcraShield Advance with roller, brush or airless spray to the recommended spread rate as per the specification shown in SELECTIONS.

Completion

3.19 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials

4.1 CAVITECLAD EIFS INSULATION SHEET

Supplier:	Specialized Construction Products
Type/Brand:	75mm Neopor® EPS Thermashell sheets
Sheet size:	75mm thick x 0.6m wide x 2.4m long
R-value:	1.29

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

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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:

BPS	Building Product Specifications
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 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
CodeMark™ CMNZ70050 ver2	Colorsteel® Dridex®

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 Altimate® Installers Guide
- COLORSTEEL Altimate® Design Guide
- COLORSTEEL Dridex® Design Guide
- COLORSTEEL Dridex® Installers 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

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Warranties

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 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.

1.7 NO SUBSTITUTIONS

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

1.8 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

1.9 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 BPS, 8.5.1 Group Numbers:

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.

2.3 FIXING CLIPS - TRAY PROFILES

Metallic coated steel or stainless steel clips, to suit the roofing material, profile metal and location as required by roofing profile manufacturer (roll-formers) products. Clip screw fixings to roofing profile manufacturer's fixing charts or Specific Engineered Design, minimum Class 3.

2.4 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.

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2.5 RIVETS

Sealed aluminium, minimum diameter 4.0mm.

Components

2.6 FLASHINGS GENERALLY

To NZBC 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.

2.7 BOOT FLASHINGS

EPDM proprietary boot flashing designed to weatherproof cylindrical penetrations.

Accessories

2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

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

2.11 PROFILE CLOSURES

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

2.12 LAP SEALING TAPE

Closed cell self-adhesive nitrile tape.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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
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).

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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

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.

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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

Manufacturer:	New Zealand Steel
Material:	COLORSTEEL® Maxam™
BMT:	0.4mm

Accessories

4.2 FLASHINGS BEHIND CLADDING

Manufacturer:	New Zealand Steel
BMT/material:	0.9mm aluminium
Coating system:	COLORSTEEL Altimate®

4.3 FLASHINGS - GENERALLY

BMT/material:	0.55mm
Coating system:	To match roofing
Coating colour:	To match roofing

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4311S STEEL & TUBE PROFILED METAL ROOFING

1 GENERAL

This section relates to the supply and fixing of **Steel & Tube** profiled metal roofing, complete with accessories.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base Metal Thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
LBP	Licensed Building Practitioner

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC G12/AS1	Water supplies
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2728	Prefinished/pre painted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
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)
BPS	Building Product Specifications
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

- Steel & Tube literature, including:
- Steel & Tube Roofing Solutions Product Guide
- Steel & Tube Product Technical Statements

NZ Steel's literature, including:

- NZ Steel: Specifiers and Builders Guide
- NZ Steel: Installers Guide
- NZ Steel Residential Warranty, Environmental Categories & Product Maintenance

Copies of the above literature are available from Steel & Tube

Web:	www.steelandtube.co.nz
Email:	roofing@steelandtube.co.nz
Telephone:	Freephone 0800 333 247

Requirements

1.4 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Steel & Tube products, or associated components and products.

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Compliance information

1.6 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's, importer's or distributor's warranty
- Installer's warranty
- Producer Statement - Construction from the installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance - Wind (design by contractor)

1.7 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

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

1.8 FIXINGS, WIND

Design and use the fixings/fixing pattern appropriate for the wind design parameters and NZMRM CoP. Refer to Steel & Tube Product Technical Statements for the selected profile. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacing.

Performance - General

1.9 PERFORMANCE

Install roofing material and associated flashings and accessories to form a weather tight and durable system.

1.10 DRINKING WATER

Roofing for collecting potable water to NZBC G12/AS1.

1.11 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile or cladding to the primary structure.

1.12 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 BPS, 8.5.1 Group Numbers.

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 STEEL - TYPE AM COATING (ALUMINIUM/ZINC/MAGNESIUM ALLOY), PREPAINTED

Formability steel sheet G550 for roll forming or G300 for flashings, coated to AS 1397. Prefinished /prepainted to AS/NZS 2728.

Coating class: AM 150 for COLORSTEEL® Maxam™

Fixings

2.2 FASTENERS GENERALLY

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

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2.3 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by the roofing manufacturer and with a minimum Category 4 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm and 3 threads engagement for screws into steel.

2.4 RIVETS

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

Components

2.5 FLASHINGS GENERALLY

To NZBC E2/AS1, 4.0 Flashings.

Grade 0.55mm BMT G300 for galvanized, Type AZ or AM coated and pre-painted steel, and 0.90mm BMT H34 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.6 FLASHINGS TO VERGE, RIDGE AND HIP

To NZBC E2/AS1, 4.0 Flashings.

Supplied by the roofing manufacturer to match or to suit the roofing.

2.7 PIPE FLASHINGS

EPDM proprietary pipe flashing laid on 45º bias to roofing, with over-flashing or soaker flashing if required.

Pipe flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided then use either an over-flashing back to the ridge, or a soaker flashing to which the pipe flashing is fixed.

Accessories

2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

Neutral curing silicone or MS polymer sealant.

2.11 LAP SEALING TAPE

Closed cell self-adhesive lap sealing tape.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Stack roofing and accessories on clean, dry and level areas of the site and protect from mechanical damage, wind damage and contamination. Loosely cover dry sheeting. If sheeting becomes wet, fillet or cross stack to allow air to circulate and dry the sheeting. Remove strippable protective film, if applied, prior to prolonged exposure to sunlight.
Avoid distortion and contact with damaging substances, including but not limited to cement and sunscreen. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage. Use soft, flat soled shoes when fixing and for all other work on the roof.

3.2 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

Inspect the roof framing and supporting structure to ensure that it is complete and ready for roofing and free from any misalignments or protrusions that could adversely affect the roofing.

For transverse flashings the framing moisture content to be a maximum of 18%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

Installation

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 SEPARATION

Place isolators between dissimilar metals and separate roofing from treated timber, cement-based or other incompatible materials, refer to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

3.6 SAFETY MESH

Fix safety mesh over exposed areas to AS/NZS 4389 and to manufacturer's requirements.

3.7 WIRE NETTING

Fix wire netting where specified to manufacturer’s recommendations, drawn tight and nailed or screwed to purlins with edges butted and twitched together to form a complete net.

3.8 LAY ROOF UNDERLAY

Fit and lap roofing underlay over the netting/mesh or use a self-supporting underlay. Lay underlay horizontally or vertically with a 150mm side lap, over-sailing the spouting and/or gutters by 10mm, in accordance with NZBC E2/AS1 and manufacturer’s recommendations.

3.9 FIX INSULATION

Refer to thermal insulation section(s).

Run and fix insulation blanked as detailed and to insulation manufacturer's recommendations. Ensure minimum 25mm air gap between insulation and roofing underlay.

Application

3.10 SET-OUT

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

3.11 END LAPS

End laps are not permitted, except where specifically detailed.

3.12 FIXING GENERALLY

Install and fix in accordance with NZMRM CoP and NZBC E2/AS1 requirements where applicable, and to Steel & Tube's recommendations. Paint colour-matched fixings and accessories before installation.

3.13 MARKING AND CUTTING

Cut using shearing tools only. Do not use black lead pencils for marking aluminium/zinc coated products. Remove all cutting and drilling debris from the roof as work proceeds.

3.14 FIX SHEETS

Fix sheets in place using the fastening system required by Steel & Tube for specified profiles, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet.

3.15 THERMAL MOVEMENT

Roof fixing and jointing to conform to NZMRM CoP and Steel & Tube requirements. For thermal movement, refer to NZBC E2/AS1, 8.4.8 Allowance for expansion, where applicable. Note that for lengths exceeding 18 metres, specific design is required.

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3.16 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of sheets.

The lower ends of trapezoidal and trough profile roofing shall be turned down at gutters, where the roof pitch is less than 10°. Form using purpose made tools.

3.17 FLASHINGS

Flash roof to parapets, walls and penetrations in accordance with details. Where no detail is provided flash to NZMRM CoP or NZBC E2/AS1 recommendations.

3.18 USE OF SEALANTS

Apply sealant in two narrow beads transversely across flashing intersections in accordance with the NZMRM CoP, close to the two edges. Avoid exposing sealant on outside surfaces.

3.19 FLASHING PENETRATIONS

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

3.20 INSTALL RIDGING

Install ridging by fastening to the purlins through the leading edge of the roofing. Do not fasten transverse flashings to timber with moisture content >18%.

Completion

3.21 COMPLETION MATTERS

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

Remove swarf and excess material daily during the work. Remove strippable, protective film, if applied, prior to prolonged exposure to sunlight.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

4 SELECTIONS

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

Roofing

4.1 STEEL & TUBE - CUSTOM ORB, CORRUGATE ROOFING

BMT/material:	0.4mm
Coating system:	COLORSTEEL® Maxam™
Purlin material:	Timber
Fixing:	Minimum 12g x 50mm HWF dual point/T17 with neoprene seals
Fixing pattern:	Refer to Steel & Tube Custom Orb PTS for details

4.2 STEEL & TUBE - PLUMBDEK, LOW RIB TRAPEZOIDAL ROOFING

BMT/material:	0.4mm
Coating system:	COLORSTEEL® Maxam™
Purlin material:	Timber
Fixing:	Minimum 12g x 60mm HWF dual point/T17 with neoprene seals
Fixing pattern:	Refer to Steel & Tube Plumbdek PTS for details

Accessories

4.3 FLASHINGS - GENERALLY

BMT/material:	0.55mm
Coating system:	To match roofing
Coating colour:	To match roofing

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4.4 FLEXIBLE PIPE FLASHING

Brand/Type: Dektite

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4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS

1 GENERAL

This section relates to the fabrication, supply, and installation of APL Window Solutions residential window and door systems.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

WGANZ	Window & Glass Association NZ
PQAS	Powder Coating Quality Assurance System

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F4/AS1	Safety from falling
NZBC G4/AS1	Ventilation of buildings
NZBC H1/AS1	Energy efficiency for all housing and buildings up to 300m²
NZBC H1/AS2	Energy efficiency for buildings greater than 300m²
NZBC H1/VM1	Energy efficiency for all housing and buildings up to 300m²
NZBC H1/VM2	Energy efficiency for buildings greater than 300m²
AS/NZS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
BS EN 673	Glass in building - Determination of thermal transmittance (U-value) - Calculation method
AAMA 2603	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
ISO 10077-1	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - General
ISO 10077-2	Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Numerical method for frames

Window & Glass Association NZ (WGANZ) documents:

Window Installation Guide	Guide to Window Installation as described in E2/AS1
SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)

US Federal Specification:

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

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CodeMark™ CMNZ10033 ver2	APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors.

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

APL Window Solutions	Specifier Guide
APL Window Solutions	Metro Series ThermalHEART® with Centrafix™ System Guide (Version 08/23a)
APL Window Solutions	Windows and Doors for Residential Purposes BPIR
APL Window Solutions	Windows and Doors for Residential Purposes - Thermally Insulated BPIR
APL Window Solutions	Entrance Door Overview
APL Window Solutions	Testing of APL new window and installation to EM9 test method

BRANZ Appraisal 1188 (2023) - APL Metro Series ThermalHEART® with Centrafix™ Windows and Doors - Amended 2 May 2024
BRANZ Appraisal 1259 (2024) - APL ThermalHEART+® Window and Door Systems - Amended 2 May 2024

Manufacturer/supplier contact details

Company:	Architectural Profiles Ltd.
Trading as:	APL Window Solutions
Web:	www.altherm.co.nz www.firstwindows.co.nz www.vantage.co.nz www.aplnz.co.nz
Email:	apl.techinfo@aplnz.co.nz altherm.techinfo@aplnz.co.nz firstwindows.techinfo@aplnz.co.nz vantage.techinfo@aplnz.co.nz
Telephone::	07 849 8888

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.

1.6 DESIGN PARAMETERS - WIND

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

1.7 MARKING - EXTERNAL WINDOWS / DOORS

Each window claimed by the manufacturer to be complaint with NZS 4211 to be labelled on the frame to NZS 4211.

Compliance Information

1.8 COMPLIANCE - BRANZ APPRAISAL

APL ThermalHEART+® Window and Door Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1259.

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Performance

1.9 EXTERNAL WINDOW PERFORMANCE

APL Window Solutions windows and doors have been tested to NZS 4211 and the requirements of BPS, 4.4.1 Structural and weathertightness provisions.

1.10 THERMAL PERFORMANCE - WINDOWS & GLAZED DOORS, HOUSING ONLY

Thermal performance of windows & doors to NZBC H1/AS1. The construction R-Value of windows & doors determined by Appendix D, Table D1.1.1: Construction R-values (R window) of selected generic windows and doors.

2 PRODUCTS

2.1 WINDOWS

Refer to SELECTIONS.

2.2 DOORS

Refer to SELECTIONS.

Materials

2.3 ALUMINIUM EXTRUSIONS

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

2.4 ALUMINIUM SHEET AND STRIP

Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.

Alloy designation: 5251 - H16 or 5005 - H16

2.5 STAINLESS STEEL SHEET AND STRIP

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

2.6 GLASS

Refer to the glazing section for glass types and installation.

Reveals

2.7 REVEALS - TIMBER PAINTED

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

Flashings

2.8 FLASHINGS GENERALLY

To NZBC E2/AS1, 9.1.9 Windows and doors. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components for installation - direct fix systems

2.9 SILL PAN FLASHING

To NZBC E2/AS1, paragraphs 9.1.10.3 - 9.1.10.6. Flashing for direct fix claddings to collect and drain water that may penetrate through the window or door unit. Size to extend from the inner most point of the aluminium frame out over the external face of the cladding.

2.10 SUPPORT ANGLE

WGANZ aluminium support angle for use below the sill pan for deeper claddings to transfer the weight of the window back to the frame. Size to suit cladding thickness.

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Components for installation - cavity systems

2.11 STANDARD CAVITY CLOSER

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

2.12 SUPPORT BAR

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

Components

2.13 GLAZING GASKETS

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

2.14 HARDWARE AND FURNITURE

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

2.15 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Section 2.0, Opening windows.

2.16 FIXING BRACKETS

Designed by manufacturer to specific design.

2.17 WEATHERING/INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT-S-001543A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT-S-00230C.

Finishes

2.18 DURALLOY +PLUS POWDER COATED ALUMINIUM

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

2.19 DURATEC POWDER COATED ALUMINIUM

High-performance polyester powder coating in accordance with WGANZ PQAS and AAMA 2604.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

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Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with manufacturer's shop drawings and installation instructions.

Fabrication

3.6 FABRICATION

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

3.7 TIMBER REVEALS

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

3.8 HARDWARE GENERALLY

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

3.9 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.

3.10 PASSIVE VENTILATION

Factory fit all required and scheduled passive ventilation systems to NZBC G4/AS1, paragraph 2.2.2.5, NZS 4303 and manufacturer's requirements.

Installation - windows and doors

3.11 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed.

3.12 EXPOSED FIXINGS AND FASTENINGS

Fixings and fastenings exposed to the weather to be aluminium, or Type 304 stainless steel.

3.13 PROTECTED FIXINGS AND FASTENINGS

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

3.14 CORROSION PROTECTION

Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

3.15 INSTALLATION FIXING

To NZBC E2/AS1, paragraph 9.1.9.10. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings.

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

3.16 INSTALLATION CAVITY CONSTRUCTION

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

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to NZBC E2/AS1, Figure 8.5.6.1D: Junctions with walls for membrane.

3.17 INSTALL FLASHINGS

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

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

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

3.18 COMPLETE AIR SEAL

To NZBC E2/AS1, 9.1.5 Air seals. Form an air-tight seal by means of proprietary expanding foam or sealants used with PEF backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.19 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.20 SEAL FRAMES ON SITE

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

3.21 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

3.22 BACK UP

When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

3.23 SEALANT FINISH

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

3.24 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM

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

3.25 SAFETY

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

Completion & Commissioning

3.26 COMPLETION MATTERS

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

4 SELECTIONS

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

Glazing

4.1 GLASS

Type/thickness: Refer to 4610AG AGP GLAZING RESIDENTIAL for type and thickness.

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Reveals

4.2 TIMBER JAMB REVEALS

Timber species:	Radiata Pine
Grade/treatment:	H3.1
Thickness:	19mm
Reveals:	Flush finish for architraves

Window and door system - RESIDENTIAL SERIES - THERMALHEART+®

4.3 APL RESIDENTIAL THERMALHEART+ FIXED WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

4.4 APL RESIDENTIAL THERMALHEART+ AWNING WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved
Fastener range:	Urbo Helix

4.5 APL RESIDENTIAL THERMALHEART+ SLIDING WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

4.6 APL RESIDENTIAL THERMALHEART+ BIFOLDING WINDOW

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

4.7 APL RESIDENTIAL THERMALHEART+ SLIDING DOOR

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

4.8 APL RESIDENTIAL THERMALHEART+ HINGED DOOR

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

4.9 APL RESIDENTIAL THERMALHEART+ BIFOLDING DOOR

Type:	APL Residential Series THERMALHEART+®
Frame type:	Thermally Improved

APL Entrance doors

4.10 APL ENTRANCE DOOR - HINGED DOOR WITH SIDELIGHT

Type:	APL Core Entrance Door
Range:	Axis - with sidelight
Glazing:	Double glazing

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4555 GARAGE DOORS

1 GENERAL

This section relates to the manufacture, supply and installation of garage door systems including required opening/operating systems.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170	Structural design actions
AS/NZS 1170.2: 2011	Structural design actions - Wind actions
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
NZS 3604	Timber-framed buildings
AS/NZS 4505	Garage doors and other large access doors

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

Requirements

1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

Performance

1.3 DESIGN PARAMETERS WIND

Design the installation to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.4 LOADS - NON - SPECIFIC DESIGN - DOORS UP TO 3.0M HIGH

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind performance requirements to NZS 3604.

1.5 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

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2 PRODUCTS

2.1 GARAGE DOOR

Manufacture to AS/NZS 4505 complete with a compliance label.

3 EXECUTION

3.1 PREPARATION FOR INSTALLATION

Check that the trimmed and lined openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed.

3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weathertight fit round the entire perimeter.

3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

Completion

3.6 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

3.7 REPLACE

Replace damaged, cracked or marked elements.

3.8 LEAVE

Leave work to the standard required by following procedures.

3.9 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

4.1 GARAGE DOOR - SECTIONAL OVERHEAD DOOR



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4610AG AGP® GLAZING RESIDENTIAL

1 GENERAL

This section relates to the supply and fixing of **AGP®** glass products for use with APL Window Solutions external and internal joinery in residential type buildings and includes:

- Window and door glazing

This **AGP** section is to be read in conjunction with **APL Window Solutions** branded sections

1.1 RELATED WORK

Refer to Refer to 4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS for aluminium joinery

1.2 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

IGU	Insulating Glass Units
PVB	Polyvinyl Butyral
uPVC	Unplasticised polyvinyl chloride

Documents

1.3 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC B1/AS1	Structural provisions for buildings
NZBC B2/AS1	Durability provisions for building elements
NZBC F2/AS1	Hazardous building materials
NZBC H1/AS1	Energy efficiency for all housing, and buildings up to 300m²
NZBC H1/VM1	Energy efficiency for buildings greater than 300m²
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4667	Quality requirements for cut and processed glass
NZS 4211	Specification for performance of windows
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
BPS	Building Product Specifications

1.4 MANUFACTURER'S DOCUMENTS

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

- Product notes and manufacturing limitations
- Care and maintenance of your AGP glass
- Condensation guide
- AGP Glass handling, storage & transportation guide
- Guide to visual quality of residential glass and insulating glass units (IGUs)
- Insulating glass unit (IGU) warranty

Manufacturer/supplier contact details

Company:	AGP
Web:	www.agpl.co.nz
Email:	technical@agpl.co.nz
Telephone:	07 849 8880

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Requirements

1.5 NO SUBSTITUTIONS

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

1.6 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

Compliance information

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

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

Performance

1.8 THERMAL STRESS ANALYSIS

For non-heat treated glass obtain a thermal stress analysis for tinted, reflective and other solar control vision glass including IGU's for review before placing final order.

1.9 THERMAL PERFORMANCE - EXTERNAL GLAZING

Provide external glazing to comply with H1 Energy efficiency requirements of NZBC H1/AS1 and NZBC H1/VM1.

Refer to RELATED WORK sections for Construction R-values for complete windows / glazed doors / curtain walls and/or skylights including glazing.

Performance – Wind (design by contractor)

1.10 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer requirements and as appropriate for the project wind design parameters.

2 PRODUCTS

Materials, windows and doors

2.1 CLEAR FLOAT GLASS

Clear ordinary transparent float glass for general window/door glazing application. Thickness to NZS 4223.1, NZS 4223.Supp1, NZS 4223.3 and NZS 4223.4.

2.2 OBSCURE GLASS

Translucent rolled glass, sand-blasted or acid etched on one surface for a decorative finish.

2.3 LAMINATED GLASS

Grade A safety glass to AS/NZS 2208 with PVB interlayer.

2.4 TOUGHENED GLASS

Grade A safety glass to NZBC F2/AS1 and AS/NZS 2208.

Heat soaked toughened glass to NZS 4223.1, Appendix E for critical areas.

2.5 REFLECTIVE AND COATED FLOAT GLASS

Coated float glass incorporating both solar and thermal insulation properties, or coated float glass with thermal insulation properties only.

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2.6 INSULATING GLASS UNITS (IGU'S)

To the performance requirements of NZS 4223.2.
Marking to NZS 4223.2 as modified by NZBC B2/AS1, 3.4.3 Insulating glass units.
Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:

- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

Components, aluminium and uPVC glazing

2.7 GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

2.8 SETTING BLOCKS

APL Window and Door Systems setting blocks consisting of PE, PP or PA material selected to suit the frame and panel type.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 4223.1, NZS 4223.2, NZS 4223.3 as modified by BPS paragraph 4.4.1.4, and NZS 4223.4.
Interface between external glazing and other elements to be wind and watertight on completion.

3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products, and to the AGP Glass handling, storage & transportation guide.

3.3 ROUTINE MATTERS

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

3.4 PRE-INSTALLATION REQUIREMENTS

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

3.5 GLASS CONDITION

All glass to have undamaged edges and surfaces in accordance with AS/NZS 4667.

3.6 GLASS THICKNESS

Whether stated in a glazing schedule or not, confirm glass thicknesses to NZS 4223.1, NZS 4223.3, NZS 4223.4. For windows tested to NZS 4211, ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading, or human impact considerations govern.

3.7 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to NZS 4223.1, Section 4 Glazing.

Conditions - human impact safety requirements

3.8 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to NZS 4223.3 as modified by BPS paragraph 4.4.1.4, for thickness and maximum areas of safety glass.

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3.9 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in NZS 4223.3, that also comply with the relevant requirements of AS/NZS 2208. Ensure material is permanently marked and if cut by the distributor or installer mark each piece to NZS 4223.3, 2.8 Identification.

3.10 CONTAINMENT

Edge cover to comply with NZS 4223.1, Section 4 Glazing, table 5. Otherwise to NZS 4223.3, 2.3 Edge cover.

Assembly

3.11 WORKING OF GLASS

All working of glass as required in NZS 4223.1.

3.12 EDGE WORK

Edge work other than a clean cut.

Installation/application

3.13 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.
Refer to AS/NZS 4667 and NZS 4223.1 for glass and glazing.

3.14 INSTALL SAFETY GLASS

To NZS 4223.3.

3.15 INSTALLING INSULATING GLASS UNITS

Refer to the APL branded window manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to the manufacturers requirements. Fit setting and location blocks and bead glaze units using a compatible sealant.

3.16 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar control glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

Application aluminium

3.17 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS 4223.1.

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

Finishing

3.18 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion & Commissioning

3.19 COMPLETION MATTERS

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

3.20 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS

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

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Performance - wind

4.1 WIND ZONE - NON-SPECIFIC DESIGN
Refer to general section 1220 PROJECT for design wind pressures.



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4710KN KNAUF THERMAL & ACOUSTIC INSULATION

1 GENERAL

This section relates to Knauf Insulation thermal and acoustic insulation materials for walls, ceilings and roofs.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

STC	Sound Transmission Class

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC G6/VM1	Airborne and impact sound
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations (Known as the Australian/ New Zealand Wiring Rules)
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 4859.1	Thermal insulation materials for buildings - General criteria and technical provisions
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:
CodeMark certificate CMNZ30095 ver3 - Knauf Insulation
Technical data sheet - Knauf Insulation Roof Blanket October 2024
Technical data sheet - Knauf Insulation: Ceiling/Skillion Roof October 2024
Technical data sheet - Knauf Insulation: Wall October 2024
Technical data sheet - Knauf Insulation External DuctWrap October 2024

Manufacturer/supplier contact details

Company:	Knauf Insulation Ltd.
Web:	https://knauf.com/en-NZ/knauf-insulation
Telephone:	0800 562 834

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.6 NO SUBSTITUTIONS

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

1.7 SOUND CONTROL SITE TEST

Site test each sound rated element to NZBC G6/VM1 for compliance with specified sound transmission loss, using a nominated acoustic consultant. Rectify any element that does not meet the specified STC figure.

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Compliance information

1.8 COMPLIANCE - CODEMARK CERTIFICATE

Knauf Insulation has been appraised as meeting the requirements of the NZBC when used within the Conditions and Limitations of CodeMark certificate CMNZ30095 ver3 - Knauf Insulation.

Performance

1.9 FIRE PROPERTIES - NON-COMBUSTIBLE

KNAUF insulation products are classified as non-combustible when tested to NZS/AS 1530.1.

2 PRODUCTS

Materials - insulation

2.1 KNAUF INSULATION THERMAL AND ACOUSTIC INSULATION BATTS

Silicone treated glasswool batts for installation in skillion roofs, ceilings, external and internal walls to AS/NZS 4859.1. Smooth finish on both sides. Available in a range of R-values, sizes and thicknesses. STC up to 55dB can be achieved in specific wall constructions.

Components

2.2 WIRE NETTING

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

2.3 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation - general

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALL INSULATION - GENERALLY

Install insulation in a dry protected environment. Lay, fit and fix insulation without gaps, tucks, folds and over compaction to Knauf Insulation installation requirements and to NZS 4246 for all housing and buildings up to 300m². Allow insulation to re-loft/relax prior to installation. Do not cover vents. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath. Use insulation offcuts to fill small gaps between framing.

3.6 INSULATION CLEARANCES

Provide insulation clearances to NZS 4246 and for recessed luminaires AS/NZS 3000, 4.5.3.2. Where allowed by these standards provide insulation clearances to product manufacturer's stated clearances. Secure insulation in place so clearances are maintained and use guards/barriers , if required, where insulation is not secured.

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3.7 LAY WIRE NETTING - UNDER JOISTS / PURLINS

Lay at right angles across the rafters/roof joists (under purlins). Pull tight and fix.

3.8 LAY WIRE NETTING - OVER PURLINS

Lay at right angles across the purlins with enough slack to allow insulation to retain its nominal thickness between. Tie edges of netting together with galvanized wire clips.

3.9 LAY PLASTIC STRAPPING TAPE

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

3.10 PREPARATION INSULATION

Before installation, gently agitate the insulation by shaking or bouncing to assist recovery to the nominal thickness stated on the product label. Maintain the insulation in a dry state.

3.11 CUTTING INSULATION TO SIZE

Tear insulation by hand or cut with an insulation saw/knife, sharp scissors, or with sharp wide-blade knife. Cut slightly oversized for snug friction fit.

Installation - insulation

3.12 INSTALL KNAUF INSULATION WALL INSULATION - TIMBER FRAME

Friction fit insulation slabs between framing.

3.13 INSTALL KNAUF INSULATION CEILING INSULATION - SINGLE LAYER INSTALLATION

Friction fit slabs between truss framing with notch fit over truss bottom chord. Butt up adjacent slab under slight compression. Install to the midpoint of the top plate. Maintain a 25mm clearance gap between the insulation slabs and roof underlay.

3.14 INSTALL KNAUF INSULATION SKILLION ROOF INSULATION - SINGLE LAYER INSTALLATION

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

Completion

3.15 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to https://knauf.com/en-NZ/knauf-insulation
Substitutions are not permitted to the following, unless stated otherwise.

Materials - insulation

4.1 KNAUF INSULATION WALL INSULATION

Supplier:	Knauf Insulation
Brand/Type:	Knauf Insulation Wall
R-value:	R2.8 & R3.2
Nominal stabilised thickness:	90mm & 140mm

4.2 KNAUF INSULATION CEILING INSULATION

Supplier:	Knauf Insulation
Brand/Type:	Knauf Insulation Ceiling
R-value:	R7.0
Nominal stabilised thickness:	330mm

4.3 KNAUF INSULATION SKILLION ROOF INSULATION

Supplier:	Knauf Insulation
Brand/Type:	Knauf Insulation Skillion
R-value:	R3.4
Nominal stabilised thickness:	110mm

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4821 FLASHINGS

1 GENERAL

This section relates to the fabrication and installation of flashing systems not forming part of a proprietary system.

Documents

1.1 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability provisions for building elements
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
AS/NZS 2728	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
NZS 3604	Timber-framed buildings
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Requirements

1.2 QUALIFICATIONS

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

1.3 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

Standards of performance

1.4 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with NZBC B2/AS1. The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to NZBC B2/AS1, Table C.1.1.1 and NZBC E2/AS1, Table C.1.1.1A: Material selection.

1.5 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with NZBC E2/AS1, Table C.1.1.1A: Material selection, to minimise corrosion. Refer to either NZS 3604 Clause 4.2 or AS/NZS 2728 for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to NZBC E2/AS1, Table C.1.1.1B: Compatibility of materials in contact, and Table C.1.1.1C: Compatibility of materials subject to run-off.

1.6 PROTOTYPES - REVIEW

Refer to the general section 1270 CONSTRUCTION for details of how prototypes will be reviewed and how instructions to proceed will be given. For flashings where there are no specific details or drawings, provide full size prototypes of the flashings to integrate components into the weathertight system. Co-ordinate with the trades affected by the installation. Provide the prototype flashings to the contract administrator for review.

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2 PRODUCTS

2.1 FLASHING MATERIALS

Acceptable materials for flashings are described in NZBC E2/AS1, 4.0 Flashings. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the building and cladding materials and their fixings.

2.2 FLASHING FABRICATION

Fabricate flashings generally to NZBC E2/AS1, 4.0 Flashings, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to NZBC E2/AS1, 4.0 Flashings, or as shown on the drawings.

2.3 FIXINGS

Rivets, screws, nails and cleats to be compatible with the materials being fastened. Fasteners complying with the corrosion requirements of AS 3566 are suitable for use with ZINCALUME® steel products. Use only low carbon non-conductive sealing washers.

2.4 JOINTS - SEALANTS

Neutral Curing silicone or MS polymer sealant as required, with low resistance to compression and be-able to withstand large temperature variations. MS polymer sealant to be used where the sealant is exposed and the surrounding surfaces are to be subsequently painted or coated.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep flashings dry in transit. Take delivery of flashings in an undamaged condition. Reject all damaged materials.

3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, well ventilated, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until fixed.

3.3 HANDLING

Avoid distortion and contact with potentially damaging surfaces/substances. Do not drag flashings across each other, or across other surfaces. Protect edges, corners and surfaces from damage.

3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the installer for the specified flashings, level and in true alignment.

3.5 PROTECT

Protect surfaces, window and door joinery, and finishes already in place, from the possibility of damage during the installation process.

3.6 CONFIRM LAYOUT

Before commencing work confirm the proposed installation of the flashings and expansion joints and other visual considerations of the finished work.

3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

Application

3.8 INSTALLATION

Install flashings in accordance with NZMRM CoP and in compliance with NZBC E2/AS1, 4.0 Flashings. For very high wind zones and where the pitch of the roof is below 15° the flashing joint laps shall be sealed with sealant at each end of the lap to prevent the ingress of water.

Refer to NZBC E2/AS1, Table 4.5.1.1: General dimensions of metal flashings and other flashings as listed, for general dimensions of flashings.

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3.9 FIXINGS

Fix flashings with fasteners appropriate to the situation. For fixing flashings with proprietary brackets or clips ensure they are aligned to allow for movement and are compatible with the flashing material.

Fix screws with the shank perpendicular to the surface of the flashing with the washer fitted firmly against the flashing. Screws to be compatible with the flashing material.

Rivets 'blind' or 'pop' are to be sealed when used. Aluminium rivets are compatible with zinc or AZ coated steel. Monel and stainless steel rivets can be used to fix galvanized steel flashings. Minimum diameter of rivet to be used is 4.0mm. Drill hole 1mm larger than the rivet size. Seal head of rivet with neutral cured silicone.

3.10 JOINTING - SEALANTS

Clean surfaces to be lapped using a solvent ensuring all traces of the solvent are removed with a clean rag. Apply sealant by gun in a continuous bead of approximately 5mm diameter. Width of sealant when compressed should not exceed 25mm. Sealant joints shall be mechanically fixed for strength. Refer to NZMRM CoP for details.

3.11 FINAL INSPECTION

A final inspection by the installer to take place after completion of the flashing work. Any defects or subsequent damage to be made good.

Completion

3.12 PROTECT

Protect new work from damage.

3.13 REPLACE

Replace all damaged or marked elements.

3.14 LEAVE

Leave work to the standard required for following procedures.

3.15 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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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

The following abbreviations apply specifically to this section:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC C/AS2	Protection from fire for buildings other than risk group SH
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
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® Noise Control Systems (September 2017)
GIB® Fire Rated Systems (September 2024)
GIB® Wet Area Systems (February 2021)
GIB® Curveline Specification and Installation Manual for Curved Walls and Ceilings
GIB Toughline® Aqua (July 2018)
GIB Ezybrace® Systems (August 2016)
GIB Ezybrace® Bracing Design Software
GIB Ezybrace® Bracing Supplement Document (December 2016)
GIB Ezybrace® for Light Steel Frame Systems (March 2017)
GIBFix® Framing System (August 2016)
GIB Rondo® Metal Batten System (September 2024)
GIB-Cove®
GIB RocTape®
GIB® Goldline™ Platinum Tape-on Trims
GIB® UltraFlex high impact corner mould
GIB® Tough Systems (November 2014)
BRANZ Appraisal 289 (2024) GIB® Fire Rated Systems
BRANZ Appraisal 394 (2025) GIB® Noise Control Systems
BRANZ Appraisal 427 (2021) GIB® Wet Area Systems
BRANZ Appraisal 928 (2021) GIB EzyBrace® Systems

Manufacturer/supplier contact details
Company: Winstone Wallboards

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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.

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.

Compliance

1.7 COMPLIANCE - BRANZ APPRAISAL 427

GIB® Wet Area Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 427.

1.8 COMPLIANCE - BRANZ APPRAISAL 928

GIB EzyBrace® Systems has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 928.

Performance

1.9 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
- GIB Ezybrace® for Steel Frame Housing (NASH) Software (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

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

Components

2.2 CEILING BATTENS

GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

2.3 GIBFIX® ANGLES

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

2.4 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:

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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.

2.5 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

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

2.6 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.7 CONTROL JOINTS

GIB® Rondo® P35 control joints.

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

Accessories

2.8 ADHESIVE

Timber frame and/or steel frame:

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

2.9 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

2.10 JOINTING TAPE

GIB® jointing tape.

2.11 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 LEVELS OF PLASTERBOARD FINISH

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

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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 PRE-INSTALLATION REQUIREMENTS - STEEL 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 requirement. Refer to GIB® Site Guide.

3.6 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.

3.7 PROTECTION

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

Application

3.8 INSTALL CEILING BATTENS

Install to GIB® Rondo® Ceiling Batten Systems requirements.

3.9 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.

3.10 LINING WALLS AND CEILINGS GENERALLY

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

3.11 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.

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3.12 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.

3.13 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.14 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems.

3.15 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide requirements.

3.16 INSTALL TAPE-ON TRIMS

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

Finishing

3.17 FINISHING GENERALLY

To GIB® Site Guide and AS/NZS 2589.

Completion & Commissioning

3.18 COMPLETION MATTERS

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

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Plasterboard type / Lining requirements	Thickness
GIB® Standard plasterboard	10mm
GIB® Standard plasterboard	13mm
GIB Ultraline® plasterboard	10mm
GIB Ultraline® plasterboard	13mm

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Plasterboard type / Lining requirements	Thickness
GIB Aqualine® plasterboard	10mm
GIB Aqualine® plasterboard	13mm
GIB Toughline® Aqua	13mm

4.3 GIB® STANDARD SYSTEMS CEILINGS

Plasterboard type / Lining requirements	Thickness
GIB® Standard plasterboard	13mm
GIB Ultraline® plasterboard	13mm

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Plasterboard type / Lining requirements	Thickness
GIB Aqualine® plasterboard	13mm
GIB Toughline® Aqua	13mm

4.5 GIB® BRACING SYSTEMS

Refer to:

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- GIB Ezybrace® Systems

For bracing element location refer to drawn documentation.

Accessories

4.6 GIB® RONDO® CEILING BATTENS

Brand/type:	GIB® Rondo® Ceiling battens
Batten type:	Gib Rondo GR 310 DF
Clip type:	N/A

4.7 GIBFIX® FRAMING SYSTEM COMPONENTS

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



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5171RI RCS INTEGRA LIGHTWEIGHT CONCRETE INTERTENANCY SYSTEM

1 GENERAL

This section relates to the supply and installation of Resene Construction Systems INTEGRA Central Barrier Intertenancy System.

It includes:

- Integra Aerated Autoclaved Concrete (AAC) panels
- Adhesive plaster
- Aluminium brackets
- Components and accessories to complete the installation

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AAC	Autoclaved aerated concrete
FRR	Fire Resistance Rating
STC	Sound transmission class
Rw	Sound Reduction Index

Documents

1.2 DOCUMENTS

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

AS 1530.4	Methods for fire tests on building materials, components and structure - Fire-resistance tests for elements of construction
ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Measurement of airborne sound insulation

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

BRANZ Appraisal 1064 (2025) - Integra Central Barrier Intertenancy System
Integra Central Barrier Intertenancy System Technical Manual, Version 3 - February 2025
Integra Lightweight Concrete Intertenancy System, Timber Frame drawing register 34.00.00, 6 June 2025
Integra Lightweight Concrete Intertenancy System, Steel Frame drawing register 33.00.00, 21 May 2025
Resene Construction Systems Trade Spec™
Resene Construction Systems Project Guide

Manufacturer/supplier contact details

Company:	Resene Construction Systems
Web:	www.reseneconstruction.co.nz
Email:	help@reseneconstruction.co.nz
Telephone:	0800 50 70 40

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 years	For INTEGRA Central Barrier Intertenancy System components supplied by Resene Construction Systems

- Provide this warranty on the Resene Construction Systems standard form (if unavailable, use

the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance Information

1.7 COMPLIANCE - BRANZ APPRAISAL

The INTEGRA Central Barrier Intertenancy System has been appraised as meeting provisions of the NZBC when used within the Conditions and Limitations of its BRANZ Appraisal 1064.

Performance

1.8 SOUND RATING

The INTEGRA Central Barrier Intertenancy System has been tested to ISO 10140-2.

1.9 FIRE RATING

The INTEGRA Central Barrier Intertenancy System has been tested to AS 1530.4 and achieve FRR of 120/120/120.

2 PRODUCTS

Materials

2.1 INTEGRA AAC 50MM PANEL

50mm thick fibre-reinforced aerated concrete, 2200mm x 600mm panel.

2.2 PLASTERBOARD

Refer to relevant plasterboard section.

2.3 TIMBER FRAMING

Refer to relevant timber framing section.

Components

2.4 FIXINGS - TIMBER FRAMING

Resene Construction Systems 12g x 45mm and 75mm Galvanised screws with EPDM washer.

2.5 INTERTENANCY BRACKETS

Aluminium brackets, 50mm wide x 3mm thick with 75mm x 50mm legs and a sound & heat resistant dampener.

2.6 PSL AAC ADHESIVE

Plaster used for bonding AAC panels together, patching panels, and securing the panel to a concrete foundation. Supplied in 20kg bags.

2.7 FIRE RESISTANT MINERAL WOOL PACKING

Resene Construction Systems FireWool™, fire resistant mineral wool.

2.8 INSULATION

Refer to relevant insulation section.

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Accessories

2.9 ANTI-CORROSION COATING

Resene Galvo-Prime; brush-applied waterborne galvanised iron primer or Zinc-rich spray primer; solvent borne spray application.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Timber framing: 18% maximum moisture content

Installation - Generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with Integra Central Barrier Intertenancy System Technical Manual.

3.6 SERVICES

Conceal services within the timber framed section of the wall system, subject to the following constraints:

- A minimum of 10mm clearance to be maintained between any penetrations and the central barrier
- Penetrations to be no larger than 65mm diameter or 90mm x 50mm through the plasterboard lining
- No more than two penetrations per 600mm bay of framing to be made.

3.7 CUT PANELS

Cut panels using a circular saw with diamond tipped blade. Prime any exposed reinforcing steel using Resene Galvo-Prime, in accordance with manufacturer's instructions.

3.8 SETOUT INTEGRA PANELS

Setout INTEGRA panels prior to commencing installation. With panels oriented horizontally, setout in stacker bond or stretcher bond pattern.

Installation

3.9 FIT INTERTENANCY BRACKETS TO TIMBER WALL FRAMING

Following erection of framing to first side of the intertenancy wall install 2 Intertenancy Brackets per INTEGRA panel. Commencing from one end of the wall, position and screw fix first row of Intertenancy Brackets to every second stud using 12g x 45mm Galvanised screws with EPDM washer, brackets 300mm from finished floor level with face of bracket dampener set off the framing to the required cavity depth. Continue with subsequent rows of brackets at 600mm vertical centres.

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3.10 INSTALL INTEGRA PANELS

With panel oriented horizontally, apply AAC adhesive to underside of first panel using a spatula or broadknife. Lift and position panel against Intertenancy Brackets plumb and true to line. Drill 2mm - 3mm pilot hole through INTEGRA panel at each bracket and screw fix through panel into bracket with 12g x 75mm Galvanised screw with EPDM washer. Continue with next panels in the first row and subsequent rows above, applying AAC adhesive to underside and side faces of each adjoining panel and screw fixing to Intertenancy Brackets. Finish top row of panels as close to top plate as possible.

3.11 FIT INTERTENANCY BRACKETS TO SECOND SIDE WALL FRAMING

Following erection of second side of wall framing to enclose the INTEGRA panels, setout and fix Intertenancy Brackets staggered from brackets on the opposing side.

3.12 FIT FIREWOOL

Fill voids between INTEGRA panels and roofing underlay/sheathing with FireWool.

3.13 FIT WALL INSULATION

Refer to relevant insulation section.

3.14 INSTALL PLASTERBOARD WALL LININGS

Refer to relevant plasterboard section.

Completion & Commissioning

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.reseneconstruction.co.nz.
Substitutions are not permitted to the following Resene Construction Systemsmaterials or components, unless stated otherwise.

RCS INTEGRA Central Barrier Intertenancy System - Timber framing

4.1 RCS INTEGRA CENTRAL BARRIER INTERTENANCY SYSTEM - INTA120a

Type/brand:	Resene Construction Systems INTEGRA Central Barrier Intertenancy System
System:	INTA120a
FFR:	120/120/120
STC:	64
Rw:	62
Framing:	Timber
Lining:	1 layer 10mm standard plasterboard each side

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5230 INTERIOR DOORS

1 GENERAL

This section relates to the supply and installation of interior doors.

1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

1.2 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

1.3 DOCUMENTS

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

NZS 3602	Timber and wood-based products for use in building
NZS 3610	Specification form profiles of mouldings and joinery

2 PRODUCTS

2.1 TIMBER

To NZS 3602.

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to NZS 3610. Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

2.3 DOORS, TIMBER VENEER

Doors as scheduled complete with matching 6mm clashing strip to both sides and to the exposed edge of cavity slider doors.

2.4 DOORS, PAINTED

Doors as scheduled (without clashing strips).

2.5 CAVITY SLIDERS

Doors hung within a proprietary cavity slider frame and complete with brand-matched sliding door gear.

2.6 FRAMED AND GLAZED DOORS

Solid timber framed doors, stop end jointed and bead glazed.

2.7 FRAMED AND PANELLED DOORS

Solid timber framed doors, stop end jointed and beaded as detailed.

2.8 FRAMED AND LOUVRED DOORS

Solid timber framed doors, stop end jointed and beaded as detailed.

2.9 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

2.10 SLIDING DOOR GEAR

To suit door/sash size and glazed weight and as detailed.

2.11 SLIDING-FOLDING DOOR GEAR

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

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3 EXECUTION

3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

3.2 EXECUTION GENERALLY

Manufacture to the methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -

- Hinges

3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

Internal doors

3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

3.6 DOOR FRAMES, SOLID REBATED

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.7 DOOR LINERS

Heads and jambs finished minimum 18mm, with 10mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.8 DOOR LINERS, EXTENDED

Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.9 CAVITY SLIDERS

Install in accordance with the door manufacturer's requirements, allowing for removal of top trim for maintenance.

Completion

3.10 CHECK

Check and adjust operation of all sashes, doors, hardware and furniture.

3.11 TEMPORARY PROTECTION

On completion remove any temporary protection and leave ready for following work.

4 SELECTIONS



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5313GS GIB RONDO METAL CEILING BATTEN SYSTEMS FOR GIB PLASTERBOARDS

1 GENERAL

This section relates to the supply and installation of GIB Rondo metal ceiling batten systems.

It includes:

- Direct fix ceiling batten system
- Clip fix ceiling batten systems
- Suspended ceiling batten 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:

BMT	Base metal thickness
TCR	Top cross rail

The following definitions apply specifically to this section:

Single span	Spans between two supports only
Multi span	Continuous span across more than two supports

Documents

1.2 DOCUMENTS

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

AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
GIB Rondo Metal Batten Systems - Brochure
GIB Rondo Metal Batten Systems - Specification and installation manual (Sep 2024)
GIB Rondo Metal Batten Selector Chart
GIB Site Guide - For residential and commercial installations (Apr 2024)
GIB Rondo BPIR documentation

Manufacturer/supplier contact details

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

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

10 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.

Requirements

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.6 NO SUBSTITUTIONS

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

Compliance information

1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer / supplier 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.

2 PRODUCTS

Materials - GIB Rondo direct fix ceiling batten system

2.1 GIB RONDO DIRECT FIX 310 METAL CEILING BATTEN SYSTEM

GIB Rondo 310 metal ceiling batten system comprising G2 Z275 hot-dip galvanized steel components to AS 1397 including 35mm x 40mm furring battens with 55mm x 21mm batten jointers.

Components

2.2 METAL CEILING BATTENS

G2 Z275 hot-dipped galvanized furring battens to AS 1397. Available in a range of sizes.

2.3 BATTEN JOINTERS

G2 Z275 hot-dipped galvanized batten jointers to AS 1397. Available in a range of sizes.

2.4 PERIMETER CHANNELS

G2 Z275 hot-dipped galvanized perimeter channels to AS 1397. Available in a range of sizes.

2.5 PERIMETER ANGLES

G2 Z275 hot-dipped galvanized perimeter angles to AS 1397. Available in a range of sizes.

2.6 STEEL BACKING ANGLES

0.55mm BMT, G2 Z275 hot-dipped galvanized steel backing angles to AS 1397.

2.7 FIXINGS

Fixing type, size and material to suit application.

2.8 GIB PLASTERBOARD

Refer to relevant GIB plasterboard lining 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.

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3.3 CO-ORDINATE SERVICES

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

3.4 SITE CONDITIONS

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

3.5 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work. Coordinate with relevant framing sections to provide additional framing where required to support ceiling perimeter channels/angles and control joints.

Timber framing moisture content:	18% maximum
	8-12% for air conditioned and/or centrally heated buildings

Installation - generally

3.6 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.7 INSTALLATION - GENERALLY

Install GIB Rondo metal ceiling batten system in accordance with GIB Rondo Metal Batten Systems Specification and Installation Manual.

3.8 SETOUT

Plan setout so all battens run in the same direction with maximum spacings of 450mm for 10mm thick GIB plasterboard or 600mm for 13mm thick GIB plasterboard. Maximum batten span between direct fixing points or clips to be 900mm for single spans and/or 1200mm for multi spans.

3.9 INSTALL PERIMETER CHANNELS

Establish a datum line for the ceiling and fix perimeter channels to the walls with 32mm x 8g GIB Grabber wafer head screws or 32mm x 7g GIB Grabber dual thread screws at the required level.

3.10 INSTALL PERIMETER ANGLES

Establish a datum line for the ceiling and fix perimeter angles to the walls with 32mm x 8g GIB Grabber wafer head screws or 32mm x 7g GIB Grabber dual thread screws at the required level.

3.11 INSTALL BATTENS TO FRAMING

Set out and mark batten centres on framing above. Cut battens as required to leave a 5mm gap to the perimeter framing using tin snips, a hacksaw or grinder disk. Set battens in marked position with ends near perimeter walls inserted into perimeter channel/angle and fasten without distortion.

3.12 FIX BATTENS TO PERIMETER CHANNELS/ANGLES

Fix batten to perimeter channels/angles with 13mm x 7g GIB Grabber Pancake Head Drill Tip Screws or 3mm diameter steel rivets.

3.13 JOINTING BATTENS

Join GIB Rondo metal ceiling battens with proprietary batten jointers and fixings to suit batten type. Stagger joints between adjacent battens.

3.14 CONTROL JOINTS

Make allowance for GIB plasterboard ceiling control joints where required.

3.15 INSTALL STEEL BACKING ANGLES - RAKING CEILING

Install steel backing angles for raking ceilings to metal battens along the ceiling ridge and perimeter. Fasten each edge using 2.8mm x 30mm GIB nails or 32mm x 8g GIB Grabber wafer head screws at 300mm centres.

Completion & Commissioning

3.16 COMPLETION MATTERS

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

4 SELECTIONS

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

Materials - GIB Rondo direct fix ceiling batten system

4.1 GIB RONDO 310 DIRECT FIX (DF) SYSTEM - METAL CEILING BATTEN SYSTEM

System:	GIB RONDO 310 DIRECT FIX (DF) SYSTEM
Coding:	GR310-DF
Batten type:	310
Batten size:	35mm x 40mm
Batten jointer type:	312
Batten jointer size:	55mm x 21mm
Drop height:	35mm

Components

4.2 GIB RONDO 340 PERIMETER CHANNEL

Type/Brand:	GIB Rondo 340 perimeter channel
Channel size:	35mm x 24mm x 36mm

4.3 GIB RONDO NZ18 PERIMETER ANGLE

Type/Brand:	GIB Rondo NZ18 perimeter angle
Angle size:	32mm x 32mm

4.4 GIB RONDO GIBFIX PERIMETER ANGLE

Type/Brand:	GIB Rondo GIBFIX perimeter angle
Angle size:	45mm x 45mm

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5571SA SELLWOOD ATTIC LADDERS

1 GENERAL

This section relates to the supply and installation of Sellwood Products Ltd retractable attic ladders.

Documents

1.1 MANUFACTURER/SUPPLIER DOCUMENTS

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

- Sellwood Attic Ladders Brochure
- Sellwood Attic Ladders Installation Instructions
- Sellwood Retractable Ladder Technical Data Sheet
- Sellwood Retractable Ladder Safety Data Sheet
- Sellwood Residential Attic Ladder Warranty

Manufacturer/supplier contact details

Company:	Sellwood Products Ltd
Web:	www.sellwood.co.nz
Email:	sales@sellwood.co.nz
Telephone:	0800 288 427 (0800 ATTICS)

Requirements

1.2 QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.3 NO SUBSTITUTIONS

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

2 PRODUCTS

2.1 SELLWOOD P30 PREMIER ATTIC LADDER - RESIDENTIAL

Sellwood Premier Range Attic Ladders are manufactured from pine. Suitable for residential use for ceiling heights 2250mm to 3050mm. The opening required is 1300mm x 600mm. Weight of the unit is 31Kg. Most often used to access storage space in the attic.

Components

2.2 FIXINGS

As appropriate and supplied with the Sellwood retractable ladder specified.

Accessories

2.3 MANUAL OPENING DEVICES

Proprietary pull-down rod for manual opening supplied with the Sellwood retractable ladder.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

3.2 ROUTINE MATTERS

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

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3.3 PRE-INSTALLATION REQUIREMENTS

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

Installation/application

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install preassembled units in accordance with Sellwood Attic Ladder Installation Instructions. Make good any thermal insulation disturbed by the installation.

Completion & Commissioning

3.6 COMPLETION MATTERS

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

4 SELECTIONS

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

Residential ladder

4.1 SELLWOOD P30 ATTIC LADDER - RESIDENTIAL

Brand:	Sellwood
Type/model:	P30
Stud height:	2460mm
Opening:	1300mm x 600mm
Weight:	31Kg



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6211 WALL TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior wall tiling systems:
It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

WMAI	Waterproofing Membrane Association NZ Inc

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

BPS	Building Product Specifications
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives -Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives - Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membrane Systems

Health & Safety at Work Act: 2015

Requirements

1.3 QUALIFICATIONS GENERALLY - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.5 NO SUBSTITUTIONS

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

1.6 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

2 PRODUCTS

Materials - preparation & underlays

2.1 WATERPROOFING MEMBRANE - INTERIOR

Refer to 6811 WATERPROOFING AND ACOUSTIC UNDERLAY SYSTEMS for waterproofing membranes.

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Materials - adhesive and grout

2.2 TILE ADHESIVE

Tile adhesive, and if required primer, to suit particular location/use. To AS ISO 13007.1 and BS EN 12004.1.

2.3 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1.

Accessories

2.4 MOVEMENT JOINT SEALANT

Neutral cured or acid-cured sealant to AS 3958.1, 2.7.5 Sealant.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

Inspect tiles on delivery to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern and any tiles that are damaged.

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure that the substrate, with the preparation called for in this section, are of the quality necessary to allow tiling of the required standard. Ensure all services and accessories are in place and located to suit the tile layout.

Ensure concrete or concrete masonry walls are fully cured and dry. Ensure new concrete has cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:
Concrete 75% relative humidity or less

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles, movement joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

3.5 TEMPERATURE

Unless otherwise specified by selected tiling installation product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

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Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Internal Wet-area Membrane Systems as modified by NZBC E3/AS2.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents.

Remove any projections or unevenness. Substrate material must be even and true with a maximum variation in plane of no greater than 4mm in every 2m, in accordance with AS 3958.1, section 4.

Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATE

If required, surfaces should be primed as per manufacturer's instructions for the selected products and substrate types.

Application - waterproofing

3.12 INSTALL WATERPROOF MEMBRANE - INTERIOR WET AREAS

Refer to 6811 WATERPROOFING MEMBRANE AND ACOUSTIC UNDERLAY SYSTEMS for the installation of interior or exterior wet area membrane.

Application -tiling

3.13 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, section 5. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.
- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.14 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in

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2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.15 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method
- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method
- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method
- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile installation.

Tiles in awkward locations
- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive.

3.16 APPLY GROUTING

Remove any spacer inserts, prepare joints and apply grout in accordance with manufacturers requirements and as described in AS 3958.1, 5.7 Grouting. Ensure finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.17 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

Movement joints to walls to be a minimum of 6mm wide and to be located:
- Over existing movement joints
- At junction between different background materials
- Where tiling abuts other materials, including sanitary fixtures and windows/doors frames.
- At inter-storey height horizontally and at 3m to 4.5m apart vertically.
- At internal vertical corners in shower compartments.

3.18 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

Cleaning

3.19 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

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Completion

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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

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6221 FLOOR TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior floor tiling systems. It includes:

- Tiles
- Tile adhesives and grouts
- All relevant underlays, components and accessories necessary to complete installation

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

WMAI	Waterproofing Membrane Association NZ Inc

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC D1/AS1	Access routes
NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC E3/AS2	Internal moisture
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BS EN 12004.1	Adhesives for ceramic tiles. Requirements, assessment and verification of constancy of performance, classification and marking
BS EN 13888.1	Grouts for ceramic tiles. Requirements, classification, designation, marking and labelling.
WMAI	Code of Practice for Internal Wet-area Membrane Systems

Health & Safety at Work Act: 2015

Requirements

1.3 QUALIFICATIONS - TILING SYSTEMS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.5 NO SUBSTITUTIONS

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

1.6 HEALTH & SAFETY - SILICA DUST

Comply with Health & Safety at Work Act:2015 and take all necessary precautions as recommended in WorkSafe guidelines for Respirable Crystalline Silica (RCS).

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Performance - Slip resistance

1.7 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

2.1 TILES

Refer to SELECTIONS.

Materials - waterproofing

2.2 WATERPROOFING MEMBRANE

Refer to 6811 WATERPROOFING AND ACOUSTIC UNDERLAY SYSTEMS for waterproofing membranes.

Materials - adhesive and grout

2.3 TILE ADHESIVE

Tile adhesive to suit particular location/use, and if required primer. To AS ISO 13007.1 and BS EN 12004.1.

2.4 PROPRIETARY GROUT

Proprietary grout to suit particular location/use. To AS ISO 13007.3 and BS EN 13888.1.

Accessories

2.5 MOVEMENT JOINT SEALANT

Neutral cured or acid cured sealant to AS 3958.1, 2.7.5 Sealants.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE AND HANDLING

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

Inspect tiles on delivery to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern and any tiles that are damaged.

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

Ensure that the substrate, with the preparation called for in this section, are of the quality necessary to allow tiling of the required standard and that all services and accessories are in place and located to suit the tile layout.

Ensure concrete floors are fully cured and dry. New concrete must have cured for 28 days or more.

If in doubt check for moisture content by hygrometer. Ensure moisture content is:

Concrete	75% relative humidity or less

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3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work. Minimise in number of cut tiles and where possible, no cut tiles less than half size and only at the perimeter of the work.

3.5 TEMPERATURE

Unless otherwise specified by selected tiling product manufacturer, do not carry out tiling where the air temperature is below 5°C or substrate temperature is above 40°C.

3.6 EXTERNAL CONDITIONS

Ensure any areas of external tiling, waterproofing, floor levelling, grouting or concrete repair must be protected from hot windy conditions, rain and/or frosts during application.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Installation/application

3.8 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.9 GENERALLY

Prepare surface and complete tiling installation in accordance with AS 3958.1 and if required complete interior waterproof membrane installation to sections 1-4 of WMAI Code of Practice for Interior Wet Area Membrane Systems as modified by E3/AS2 or exterior waterproofing to NZBC E2/AS1.

Application - substrate preparation

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax and any other loose or contaminating materials. Concrete substrates should also be free of laitance, efflorescence, curing compounds and release agents. Remove any projections or unevenness.

Concrete floor substrates, after any levelling compounds or screeds applied, must be even and true with a maximum variation in accordance with AS 3958.1 Table 4.3:

- For adhesive fixing, thin bed 5mm in every 3 m
- For adhesive fixing, thick bed 10mm in every 3 m
- For mortar cement fixing, 5mm in every 3m

Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions of the tiling installation products for the relevant substrate type.

3.11 PRIME SUBSTRATES

Surfaces should be primed as per manufacturer's instructions for the selected products and substrate types.

Application - underlays

3.12 INSTALL WATERPROOF MEMBRANE

Refer to 6811 WATERPROOFING MEMBRANE AND ACOUSTIC UNDERLAY SYSTEMS for the installation of interior or exterior wet area membrane.

Application –tiling

3.13 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1. If not shown on drawings, confirm set out, bond and pattern before installation.

- Ensure cut edges are smooth and installed without jagged or flaked edges.
- Always use whole tiles or if tiles have to be cut the largest portion of a cut tile possible.

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- Maintain the heights of wall tile work in full courses to the nearest dimension.
- Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles.
- Keep joint lines, including mitres, straight and of an even width.
- Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material.
- Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.14 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, 5.4.6. Joint widths to be suited to tile and to the manufacturer's instructions.

- Ensure finished surfaces are flat and true to a tolerance of ±4mm in 2 metres from the required plane.
- Lippage between adjacent tiles shall not exceed 2mm and where joint widths are less than 3mm wide lippage shall not exceed 1mm. For tiles ground flat, such as polished tiles, lippage shall not exceed 1.5mm.
- Ensure joint widths are consistent throughout the installation, measured at the tile face.
- Ensure joint alignment is consistent throughout the installation and to a tolerance of ±4mm in 2 metres from the detailed joint alignment.
- Clean surplus bedding material from joint spaces and tile surface.

3.15 ADHESIVE APPLICATION - THIN BED

Apply a thin bed of selected tile adhesive to the adhesive manufacturer's requirements, generally final bed thickness does not exceed 3mm. Install using the following methods:

Notched trowel method

- Adhesive application to be as described in AS 3958.1, 5.6.2(a) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness and rib using notched trowel. Select trowel square notch size to suit tile size and type, to achieve full coverage. Press tile firmly onto substrate and beat into place. Additional back buttering of tiles may also be required, usually required for tiles 400x400mm and larger.

Floating method

- Adhesive application to be as described in AS 3958.1, 5.6.2(b) and to adhesive manufacturers requirements. Apply adhesive to substrate to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering method

- Adhesive application to be as described in AS 3958.1, 5.6.2(c) and to adhesive manufacturers requirements. Apply adhesive evenly to the back of each tile with a flat edged trowel. Press tile firmly onto substrate and tap into place. This method is not suitable for mosaic tile installation.

Tiles in awkward locations

- The buttering method may be required, or fixing might be necessary to achieve full bedding, even though the notched trowel method is used generally.

Ensure that the whole of the back of the tile is in good contact with the adhesive with no voids. Remove a tile periodically during installation to ensure correct coverage. Do not fix tiles over skinned adhesive

3.16 APPLY GROUTING

Remove spacer inserts, prepare joint, apply and finish off grout to the manufacturer's requirements and as described in AS 3958.1, 5.7 Grouting. Ensure grout finish is uniform in colour, smooth and without voids, pinholes or low spots.

Application - movement joints

3.17 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints in accordance with AS 3958.1, 5.4.5 Movement Joints. Joints to go right through the tile and bed to the background, maintaining any waterproofing.

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Joints, except those with reinforced edges, subject to traffic heavier than light pedestrian should not be wider than 10mm. Movement joints to floor to be located at:

- Over existing movement joints
- Intermediate movement joints to be provided to internal floors at approximately 4.5m centres where any floor dimension exceeds 9m or 6m if subjected to direct sunlight.
- Intermediate movement joints to be provided to external floors at approximately 4.5m centres where any floor dimension exceeds 4.5m.
- At perimeter where abutting perimeter walls, columns, curbs and steps. Also, where there is a change of conditions such as under-floor heating, substrate type or tile type.

3.18 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, if required install bond breaker or backing rod to control width/depth ratio, and fill with compound/sealant placed by gun. After the correct interval, finish the surface off smooth, and flush on flat areas or concave in corners, to the compound/sealant manufacturer's requirements.

Cleaning

3.19 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.20 COMPLETION MATTERS

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

4 SELECTIONS

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

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6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

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

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

Documents

1.3 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS 5131	Structural steelwork - Fabrication and erection
AS/NZS ISO 9001	Quality management systems - requirements
SNZ TS 3404	Durability requirements for steel structures and components
WorkSafe	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe	Guidelines for the management of lead-based paint
MPNZA	Health and Safety Programme

Health and Safety at Work Act 2015

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.

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1.7 MATERIAL SAFETY DATA SHEET

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

Warranties

1.8 WARRANTY

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

2 years: Warranty period

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

Performance

1.9 MANUFACTURER'S INSPECTION

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

1.10 INSPECTION OF WORK

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

2 PRODUCTS

Materials

2.1 PAINT TYPES

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

2.2 MATERIALS GENERALLY

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

2.3 THINNERS AND ADDITIVES

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

Accessories

2.4 FILLERS

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

3 EXECUTION

Conditions

3.1 EXECUTION

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

3.2 CORROSION PROTECTION SUPERVISION FOR STRUCTURAL STEEL

To AS/NZS 5131, 9.9.20, for corrosion protection of structural steel. Provide an Inspection and Test Plan (ITP) to AS/NZS 5131, 13.9.1, prior to commencement.

Corrosion protection painting to be supervised by a competent person.

3.3 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

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3.4 COATED SURFACES

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

3.5 PRE-PRIMED SURFACES

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

3.6 BRUSH DOWN

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

3.7 COMPATIBILITY

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

3.8 TREATED SURFACES

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

3.9 BACK PAINTING

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

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

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

3.10 ANCILLARY SURFACES

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

3.11 HARDWARE

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

3.12 PROTECTION

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

Preparation - gypsum plaster

3.13 PREPARING GYPSUM PLASTER

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

Preparation - painted surfaces generally

3.14 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.

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For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.15 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.

3.16 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

3.17 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.18 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.

3.19 CONCEALED JOINERY SURFACES

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

3.20 CONCEALED METAL SURFACES

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

3.21 DOORS

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

3.22 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.

3.23 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

3.24 PAINTING GENERALLY

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

3.25 MIXING

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

3.26 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the

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necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.27 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

3.28 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.

3.29 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.

3.30 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.31 DEFECTIVE WORK

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

3.32 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

3.33 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.

3.34 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.

3.35 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.

3.36 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.

3.37 REPLACE HARDWARE

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

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4 SELECTIONS

4.1 SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

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6711 PAINTING EXTERIOR

1 GENERAL

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

- 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.

Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

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

4.1 BACK PAINTING SCHEDULE

Paint 2 coats (including any pre-prime) to match exposed face coating.

Cladding type	Extent of back painting
all types	To cladding manufacturer's requirements

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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.

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Documents

1.2 DOCUMENTS

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

NZBC C/AS2	Protection from fire for buildings other than risk group SH
BPS	Building Product Specifications

Warranties

1.3 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.

Paint systems

4 SELECTIONS

4.1 BACK PAINTING SCHEDULE

Paint 2 coats (including any pre-prime) usually to match exposed face coating. If there is no coating use water resistant clear finish sealer.

Lining type	Extent of back painting
plasterboard	To lining manufacturer's requirements

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6811 WATERPROOFING & ACOUSTIC UNDERLAY SYSTEM

1 GENERAL

This section relates to a waterproofing membrane and an acoustic underlay as a system:

- applied to floor and wall surfaces to provide a waterproof and noise reducing barrier
- under internal wet area wall and floor finishes
- under external deck finishes such as tiles

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

IIC	impact insulation class

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC G6/VM1	Airborne and impact sound
NZS 4121	Design for access and mobility - Buildings and associated facilities
BRANZ	Good practice guide: Tiling

Requirements

1.3 QUALIFICATIONS

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

1.4 MAINTENANCE CONTRACT PROPOSAL

Provide a proposed contract for the certified installer to inspect annually to ensure weather tightness and durability of waterproofing System.

Compliance information

1.5 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importer's or distributors warranty
- Installer's / applicator'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

1.6 QUALITY ASSURANCE

Maintain quality necessary to assure that work is performed in accordance with this specification and the qualifying requirements of the Manufacturer.

2 PRODUCTS

Materials

2.1 WATERPROOFING UNDERLAY

Liquid applied or sheet waterproofing membrane.



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Accessories

2.2 ADHESIVE

Adhesive to suit the material and substrate and to the membrane manufacturer's requirements.

2.3 PRIMER AND SEALER

To the adhesive manufacturer's requirements for the particular substrate.

2.4 DETAIL TAPE

To the adhesive manufacturer's requirements tape used for detailing internal corners, drains, posts and penetrations. Installed prior to installation of the membrane.

2.5 MASTIC

To the mastic manufacturer's requirements, a rubberised adhesive, semi liquid membrane used to seal at membrane terminations and at end laps; for seam sealing and for membrane repairs.

2.6 TILE ADHESIVE

Refer to the tiling section(s) for compatible tile adhesive.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

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 CHECK SUBSTRATE

Ensure that the substrate is in a suitable condition to allow work of the required standard and will comply with the requirements of the NZBC E2/AS1 or NZBC E3/AS1 for the relevant substrate and membrane requirements.

Ensure that the substrate construction is well braced against movement and deflection and structurally sound. Ensure that the substrate falls to the rainwater/water outlets and water must not pond. Ensure all surfaces are clean, dry and free from dust and dirt, oils or grease with no projections of sharp materials. Complete any remedial work identified before commencing any work.

3.4 CURING OF NEW CONCRETE

Allow concrete to fully cure before applying membranes. Maximum moisture content of concrete 75%.

3.5 SURFACE PREPARATION - GENERAL

Ensure surface to receive the membrane is clean, dry and free of any foreign matter that may adversely affect the adhesion of the membrane. Do not use the products in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp
- When the substrate is wet
- Where the membrane will be left exposed to the weather or UV for a prolonged period of time as specified by the manufacturer.
- Where the surface temperature is below 10°C or above 35°C

3.6 FILM THICKNESS

Ensure that the dry film thickness specified in the membrane manufacturer's installation documents is achieved. Film thickness is an important factor to the waterproofing performance of the membrane and its long term durability.

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3.7 SAFETY PRECAUTIONS

Take extra precautions when applying the membrane and associated products, in areas where there is insufficient ventilation. Do not breathe fumes. Avoid contact with skin, wear eye /face protection.

Substrate

3.8 SUBSTRATE - CONCRETE

Concrete must have a smooth steel trowel finish and be allowed to cure for a minimum of 28 days prior to installation of membrane. Any imperfections in the concrete must be removed and any voids filled with cementitious filler before installing the membrane. The relative humidity of the concrete surface must be 75% RH or less.

3.9 SUBSTRATE - PLASTERBOARD

Plasterboard wall linings must be wet area plasterboard, manufactured and installed to manufacturer's instructions. Minimum thickness 10mm.

3.10 FALLS FLOOR

All floors must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to the installation of the membrane.

Unless stated otherwise minimum fall gradients to wastes to be provided to BRANZ Good Practice Guide - Tiling, clause 6.5 Falls in floors.

1 : 50 minimum	unenclosed shower bases (to NZBC E3/AS1, 3.3.5)
1 : 60 minimum	enclosed shower bases
1 : 50 minimum	shower bases for people with disabilities (to NZS 4121, 10.5.11.3 (b).)
1 : 60 minimum	commercial kitchens or similar
1 : 40 minimum	For tiled decks which also act as a roof

3.11 WASTE/DOWN PIPE OUTLETS

Drainage and waste outlets to be flange type. Ensure outlet pipes are fixed securely and the top surface set flush with the surface receiving the membrane application, to the membrane manufactures installation instructions.

Where falls are required ensure that the substrate falls to the outlets and water will not pond. NOTE: Fitting the outlet is the responsibility of the contractor or plumber.

Finishes

3.12 TILES

Tiles to be direct bonded to the membrane.

3.13 FINISHES / MATERIALS OVER

Install finishes / materials to manufacturers requirements over underlay.

Installation - waterproof membrane - general

3.14 PRIMING - INTERIOR

Apply water based primer for interior applications. Shake the bottle well before tipping into a paint tray. Apply primer with either a brush or roller. Allow primer to cure fully before installing the detail tape or membrane. Do not install membrane over wet primer. Clean up with water.

3.15 PRIMING - EXTERIOR

Apply solvent based primer for exterior applications. Mix the contents of the can well before use. Primer to be applied with either a brush or roller. Allow primer to cure fully before installing the detail tape or membrane. Primer will feel dry to the touch when fully cured. Do not install membrane or detail tape over wet primer. Clean up with thinners. Only prime as much area as can be installed over in half a day. Re-apply the primer where it has been exposed for more than half a day.

3.16 PREPARATION

Prime all surfaces with selected primer and allow to cure.

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3.17 DETAILING - CORNERS (FLOOR, WALL)

Cut required lengths of detail tape. Fold 150mm wide tape in half along its length with the backing paper to the outside. Remove backing paper from one half of the tape and apply along the floor or along one side of the corner and tightly into the junction. Remove remaining backing paper and adhere remaining half of the tape to the other side of the corner.

Ensure the detail tape is pressed tight into the corner, being sure to keep voids from occurring behind the detail tape. When joining detail tape allow for a 100mm overlap. Do not remove the protective plastic film from face of the detail tape until ready to lay the membrane.

3.18 INSTALL MEMBRANE

Install the membrane to manufacturer's requirements.

3.19 OVER JOINING STRIP

Position over the joining strip to manufacturers requirements.

3.20 MEMBRANE TO DRAINAGE/WASTE OUTLETS

Install the membrane over the installed detail tape to manufacturer's instructions. Star cut the membrane and fold down into the drain. Trowel smooth a bead of selected mastic around the inner lip of the drain at the termination of the membrane.

Installation - waterproof membrane - internal detailing

3.21 WALLS, INTERNAL CORNERS, TRANSITIONS

A trowelled bead of selected mastic should be placed at all membrane terminations, on internal corner seams and at vertical to horizontal transitions. End joints must be lapped a minimum of 150mm and sealed using selected mastic.

NOTE: For maximum performance, 100% contact of the membrane to the primed surface must be achieved by lightly rolling the membrane.

3.22 SHOWER MEMBRANE

Apply the membrane 1800mm up the walls or to a height of 300mm above the shower rose if higher. For unenclosed showers the membrane must extend a minimum of 1500mm out from the shower rose.

3.23 COVER ENTIRE FLOOR

Cover the entire floor in the wet area with the membrane.

3.24 UNDERFLOOR HEATING

Co-ordinate with underfloor heating installation.

Installation - waterproof membrane - external detailing

3.25 PROTRUSIONS

Apply detail tape 75mm onto the floor and 75mm up the post/protrusion. Stretch and mould the detail tape all the way around the post/protrusion.

Install membrane to the floor. Wrap the base of the post/protrusion with 150mm wide strip of membrane. Apply a generous bead of mastic at the base joint and trowel smooth. Posts/protrusions must be clad and finished as per manufacturer's specifications.

3.26 UPSTANDS, INTERNAL CORNERS, TRANSITIONS

Ensure a trowelled bead of mastic is placed at all membrane terminations, on internal corner seams and at vertical to horizontal transitions.

End joints must be lapped a minimum of 150mm and sealed using mastic.

3.27 COVER ENTIRE DECK

Cover the entire deck area with the membrane.

3.28 CONTROL JOINTS

Control joints must be installed as required.



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NOTE: Silicones must not come into direct contact with the membrane. A bond breaker tape or bond breaker sealant must be in place under all silicone joints as per Tiling Best Practice Guidelines.

Finishing

3.29 BOND BREAKER TAPE/SEALANT

Silicones must not come into direct contact with the membrane. A bond breaker tape or bond breaker sealant must be in place under all silicone joints as per Tiling Best Practice Guidelines.

3.30 REPAIRS - TRAPPED AIR

When air becomes trapped under the membrane during installation, puncture with a sharp instrument and press flat expelling all air. Prime the area at least 150mm beyond the damaged area and allow to dry. Apply a patch of membrane as big as the primed area. Press on the patch and roll firmly. Trowel smooth a bead of mastic around the joining edge.

Completion

3.31 COMPLETION MATTERS

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

3.32 PROTECTION

It is the responsibility of the main building contractor to ensure all sub-trades likely to be working in the vicinity of the membrane are aware that a waterproofing membrane has been installed and all care must be taken to protect the membrane from damage.

The tiler must lay tiles in accordance with best practice guidelines.

Commissioning

3.33 WATERPROOF TESTING

Conduct a flood test before tiling commences, to ensure membrane is watertight and suitable for use as a waterproofing membrane for wet areas. Meet the BCA compliance requirements for the test and documentation of the test.

4 SELECTIONS

4.1 WATERPROOFING UNDERLAY

Brand/type: ARDEX WPM 001

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7120 HOT & COLD WATER SYSTEM

1 GENERAL

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

Documents

1.1 DOCUMENTS

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

NZBC G4/AS1	Ventilation of buildings
NZBC G11/AS1	Gas as an energy source
NZBC G12/AS1	Water supplies
NZBC G12/AS3	Water supplies
AS 1432	Copper tubes for plumbing, gas fittings and drainage applications
AS/NZS 1477	PVC pipes and fittings for pressure applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2345	Dezincification resistance of copper alloys
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.1	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) General
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2537.3	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) fitness for purpose of system
AS/NZS 2537.4	Mechanical jointing fittings for use with cross-linked polyethylene (PE-X) for pressure applications. Plastic piping systems for hot and cold water installations - Cross linked polyethylene (PE-X) Guidance for the assessment of conformity.
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS 3688	Water supply and gas systems - metallic fittings and end connectors
AS/NZS 3879	Solvent cements and priming fluids for PVC (PVC-U and PVC-M and ABS and ASA pipes and fittings

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AS 4032.2	Water supply - Valves for the control of heated water supply temperatures - Tempering valves and end-of-line temperature actuated devices
AS/NZS 4129	Fittings for polyethylene (PE) pipes for pressure applications.
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606.1	Storage water heaters. General requirements
NZS 4606.2	Storage water heaters. Specific requirements for water heaters with single shells
NZS 4606.3	Storage water heaters. Specific requirements for water heaters with composite shells.
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS 4809	Copper pipe and fittings. Installation and commissioning
AS 5200 part 053	Plumbing and drainage products, Stainless steel pipes and tubes for pressure applications.
AS/NZS 5601.1	Gas installations - general installations
AS/NZS 60335.2.35	Household and similar electrical appliances. Safety - Pat 2.35 Particular requirements for instantaneous water heaters

Gas (Safety and Measurement) Regulations 2010
Plumbers, Gasfitters and Drainlayers Act 2006
NZ Backflow Testing Standard: NZ Backflow Testing Standard 2019, Field testing of backflow prevention devices and verification of air gaps

Warranties

1.2 WARRANTY

Provide warranty for:

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

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

Requirements

1.3 QUALIFICATIONS

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

1.4 INFORMATION FOR OPERATION AND MAINTENANCE

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

Provide this information prior to practical completion.

1.5 HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60ºC.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed:

- 45ºC - for early child hood centres, schools, elderly facilities, hospitals, psychiatric or disabled

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institutions.
- 50ºC - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:
- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

1.6 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

Performance

1.7 TESTING - TO NZBC G12/AS1

Test to NZBC G12/AS1, 7.6, Watertightness, for hot and cold water.
- Test to a pressure of1500 kpa for period not less than 15 minutes.

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

1.8 TESTING - TO AS/NZS 3500

Test to AS/NZS 3500.1 as modified by NZBC G12/AS3, Section 17, Testing and commissioning, for cold water.
- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 17.3.1 Hydrostatic test. Test storage tanks to AS/NZS 3500.1, 17.3.2 Storage tanks (except rain water tanks).

and
AS/NZS 3500.4 as modified by NZBC G12/AS3, Section 9, Testing and commissioning, for hot water.
- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 9.3 Testing. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 9.3 Testing.

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

1.9 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.10 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.11 GAS APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

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2 PRODUCTS

Materials

2.1 COPPER PIPE

To NZBC G12/AS1, 2 Materials. Copper pipe to NZS 3501, AS 1432 (type A, B & C) and AS 3688 for fittings.

2.2 PVC-U PIPE

To NZBC G12/AS1, 2 Materials. PVC-U pipes and fittings to AS/NZS 1477 and PVC-U solvent cements and primers to AS/NZS 3879. Protect from sunlight. For cold water applications only.

2.3 POLYBUTYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polybutylene tubing to AS/NZS 2642.1, AS/NZS 2642.2 and AS/NZS 2642.3 complete with fitings and accessories brand-matched . Protect from sunlight.

2.4 POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Polyethylene pipes to AS/NZS 4130 and fittings to AS/NZS 4129. Except for solid black PE, protect from sunlight. For cold water applications only.

2.5 CROSS LINKED POLYETHYLENE PIPE

To NZBC G12/AS1, 2 Materials. Cross Linked Polyethylene Pipe to AS/NZS 2492 and fittings to AS/NZS 2537.1, AS/NZS 2537.2, AS/NZS 2537.3 and AS/NZS 2537.4. Except for solid black PE-X, protect from sunlight.

2.6 WATER METER

To the requirements of the network utility operator.

2.7 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.8 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to AS/NZS 2845.1 where it is possible for water or contaminants to backflow into the potable water supply. Refer to NZBC G12/AS1, 3.4 Backflow protection & 3.5 Containment Backflow protection and NZBC G12/AS1, table 2, Selection of Backflow Protection and table 2A Containment Backflow Protection

2.9 TEMPERING VALVE

Tempering valve to NZS 4617 or AS 4032.2 to NZBC G12/AS1.

2.10 EXPANSION VESSEL

Expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4 5.9 Valves and expansion vessels.

Materials - Hot water heating appliances

2.11 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4305 NZS 4606.1, NZS 4606.2 and NZS 4606.3, electric water storage cylinder, insulated and complete with required fittings.

2.12 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE

To NZS 4305 and NZS 4602, copper thermal storage cylinder insulated and complete with pressure reducing valve and required fittings.

2.13 GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Continuous flow unit with an integral gas burner and flue to NZS 4305.

2.14 PROTECTIVE TAPE

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

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3 EXECUTION

3.1 EXECUTION GENERALLY

Generally carry out the whole of this work and tests to NZBC G12/AS1 or AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3.

3.2 HANDLE AND STORE

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

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

3.3 CORE HOLES AND SLEEVES

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

3.4 CONCEAL

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

3.5 CORROSION

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

3.6 THERMAL MOVEMENT

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

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

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

3.9 EXCAVATE

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

Application - Jointing

3.10 JOINTING COPPER PIPE

Braze pipe, fit alloy compression fittings, crox type joints and seal ring compression joints to NZBC G12/AS1 and AS 4809.

3.11 JOINTING PVC-U PIPE

Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to NZBC G12/AS1 and AS/NZS 2032.

3.12 JOINTING POLYBUTYLENE PIPE

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

3.13 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to NZBC G12/AS1 and AS/NZS 2033.

Application - Pipework installation

3.14 WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.



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3.15 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to AS/NZS 3500.1 and AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.16 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to AS/NZS 3500.4 as modified by NZBC G12/AS3 or NZBC G12/AS1, table 9 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and AS/NZS 3500.4 as modified by NZBC G12/AS3 or G12/AS1.

3.17 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to metallic water pipes and metallic sanitary fixtures as required by NZBC G12/AS1, 9.0 Equipotential bonding and/or AS/NZS 3000, 5.6 Equipotential bonding.

3.18 IN-LINE FILTER

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

Application - Hot water systems

3.19 HOT WATER CYLINDER INSTALLATION GENERALLY

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

3.20 SEISMIC RESTRAINTS - GAS WATER HEATING APPLIANCES

Gas appliances to be restrained to manufacturer's requirements, NZBC G11/AS1 and AS/NZS 5601.1 or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.21 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation or AS/NZS 3500.4, 5.5.4 Seismic restraints.

3.22 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

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

3.23 INSTALL GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Install complete with the necessary fittings to the manufacturer's requirements and in accordance with NZBC G12/AS1, 6. 11, Water heater installation. Install flue in accordance with the manufacturer's details and requirements and, AS/NZS 5601.1 (for internal or external appliances) or NZBC G4/AS1 (internal appliances). Also refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.24 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

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

3.25 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

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3.26 INSTALL EXPANSION VESSEL

Install expansion vessel to NZBC G12/AS, 6.6.7 Expansion Vessels or AS/NZS 3500.4, 5.9 Valves and expansion vessels.

3.27 PENETRATIONS

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

Installation - Valves

3.28 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.29 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

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

3.30 INSTALLING BACKFLOW PREVENTION DEVICE

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

Completion

3.31 LABEL

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

3.32 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.33 REPLACE

Replace damaged or marked elements.

3.34 LEAVE

Leave work to the standard required by following procedures.

3.35 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS



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7151NS NEWLINE SHOWER SYSTEMS & VANITIES

1 GENERAL

This section relates to the supply and installation of Newline Group Limited sanitary bathroom accessories.

It includes:

- glass shower doorsets & fixed return panels
- shower trays
- vanities
- components and accessories to complete installation

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVC	Polyvinyl chloride

Documents

1.2 DOCUMENTS

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

NZBC E3/AS1-AS2	Internal moisture
AS/NZS 2208	Safety glazing materials in buildings
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:
Newline Specification Sheets
Newline Installation Instructions
Newline Maintenance & Aftercare

Manufacturer/supplier contact details

Company:	Newline Group Limited
Trading as:	Newline
Web:	newline.nz/
Email:	info@newline.co.nz
Telephone:	09 444 2053

Warranties

1.4 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years	For installation 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

1.5 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

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1.6 QUALIFICATIONS WORKERS - INDUSTRY QUALIFICATION REQUIREMENTS

Workers or supervisors of work are required to be a Certifying Plumber under the Plumbers, Gasfitters and Drainlayers Act 2006. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

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

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

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

Provide this information prior to practical completion.

Quality control and assurance

1.9 QUALITY CONTROL SYSTEM - LEAD FREE

If requested, by the contract administrator or consenting authority, provide test reports from IANZ or equivalent accredited testing facility confirming products that contain copper alloy and are used in contact with potable water for human consumption are lead free.

2 PRODUCTS

Glass shower doorsets

2.1 ACCLAIM SHOWER DOORSET & FIXED RETURN PANELS

1960mm high frameless glass doorset with 180º hinged door, glass lintel over door, 425mm long Linear D handles and fixed glass return panel, 10mm safety glass to AS/NZS 2208. Available in a range of sizes to suit 2-sided and 3-sided trays. Aluminium glazing channels, hinged door hardware & handles available in chrome and black.

2.2 ADINA SHOWER DOORSET & FIXED RETURN PANELS

1950mm high framed glass pivot doorset with cushion seal pivot door, D handles and fixed glass return panel, 6mm safety glass to AS/NZS 2208 factory coated with EnduroShield to inner face. Available in a range of sizes to suit 2-sided and 3-sided trays. White aluminium glazing channels & frame, chrome pivot door hardware & handles.

2.3 ANITA SHOWER DOORSET & FIXED RETURN PANELS

2000mm high frameless glass doorset with sliding door, 213mm long D handles and fixed glass return panel, 8mm safety glass to AS/NZS 2208, factory coated with EnduroShield to inner face. Available in 1200mm x 915mm to suit 2-sided and 3-sided trays. Aluminium glazing channels, sliding door hardware & handles available in chrome and black.

2.4 BECKETT SHOWER DOORSET & FIXED RETURN PANELS

1900mm high frameless glass pivot doorset with pivot door, D handles and fixed glass return panel, 6mm safety glass to AS/NZS 2208. Available in a range of sizes to suit 2-sided and 3-sided trays. White aluminium glazing channels & frame, chrome pivot door hardware & handles.

2.5 RAVELLO SHOWER DOORSET & FIXED RETURN PANELS

2000mm high frameless glass doorset with sliding door, 425mm long Linear D handle and fixed glass return panel, 8mm safety glass to AS/NZS 2208. Available in a range of sizes to suit 2-sided and 3-sided trays. Aluminium glazing channels, sliding door hardware & handles available in chrome and black.

2.6 RHINE SHOWER DOORSET & FIXED RETURN PANELS

1950mm high semi-frameless glass doorset with pivot door & sliding doors, 190mm long D handle and fixed glass return panel, 6mm safety glass to AS/NZS 2208 factory coated with EnduroShield to inner face. Available in a range of sizes to suit 2-sided, 3-sided, curved corner and Neo angled corner trays. Aluminium glazing channels, frame & door hardware available in chrome, white and black. Handles available in chrome and black.

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2.7 SAMARA SHOWER DOORSET & FIXED RETURN PANELS

1950mm high semi-frameless glass doorset with pivot door & sliding doors, 190mm long D handle and fixed glass return panel, 6mm safety glass to AS/NZS 2208 factory coated with EnduroShield to inner face. Available in a range of sizes to suit 2-sided, 3-sided, curved corner and Neo angled corner trays. Aluminium glazing channels, frame and hardware available in chrome, white and black. Handles available in chrome and black.

2.8 TRADEPRO SHOWER DOORSET & FIXED RETURN PANELS

1830mm high semi-frameless glass doorset with pivot door & sliding doors, D handle, and fixed glass return panel, 6mm safety glass to AS/NZS 2208. Available in a range of sizes to suit 2-sided, 3-sided and curved corner trays. White aluminium glazing channels & frame, chrome pivot hardware & handles.

Shower trays & liners

2.9 LOW PROFILE ACRYLIC SHOWER TRAYS

Reinforced fibreglass anti-slip acrylic tray with 40mm sill height and 40mm high wall upstands, available in a range of sizes in 2-sided, 3-sided, curved corner and Neo angled corner variations. Supplied with AquaCheck™ PVC seal for wall upstands.

2.10 STANDARD PROFILE ACRYLIC SHOWER TRAYS

Reinforced fibreglass anti-slip acrylic trays with 65mm sill height and 30mm high wall upstands, available in a range of sizes in 2-sided, 3-sided, curved corner and Neo angled corner variations.

2.11 ACRYLIC LINER

Folded acrylic wall liners, available flat, with side mould shelves, or with corner mould shelves.

2.12 HOBBED TILE-OVER SHOWER TRAYS

ProFinish™ high density rigid polyurethane tile-over shower trays with 60mm high hob threshold, available in a range of sizes in 2-sided, 3-sided and Neo angled corner variations suitable for centre waste or channel drain.

2.13 RECESSED TILE-OVER SHOWER TRAYS

ProFinish™ high density rigid polyurethane tile-over level entry shower trays, available in a range of sizes in 2-sided, 3-sided and Neo angled corner variations suitable for centre waste or channel drain.

Accessories

2.14 EASY CLEAN SHOWER WASTES

Easy Clean PVC shower wastes with grate, for acrylic shower trays.

2.15 TILE SHOWER WASTES

P-trap PVC shower wastes with grate, for tiled shower trays. Available in a range of sizes and finishes.

2.16 CHANNEL DRAINS

316 stainless steel channel drains supplied with leak control flange and floor waste gully, for tiled shower trays. Available in a range of sizes and finishes.

2.17 SILICONE ADHESIVE FOR TILE-OVER TRAYS

Bostick V60 neutral cure silicone.

2.18 SILICONE ADHESIVE FOR ACRYLIC TRAYS & LINERS

Sikasil® NG neutral cure silicone.

2.19 CONSTRUCTION ADHESIVE

Max Bond synthetic rubber-based construction adhesive.

2.20 MS ADHESIVE

Modified silicone adhesive.

2.21 TILE ADHESIVE

C2S1 and C2S2 tile adhesive.

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2.22 WET AREA SILICONE SEALANT

Neutral cure silicone sealant.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work, with water supply and drainage pipework to match the requirements of selected fixtures without force or distortion.

Installation - generally

3.4 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

3.5 INSTALLATION GENERALLY

Install in accordance with NZBC E3/AS1-AS2, and Newline Installation Instructions.

Installation - acrylic shower trays

3.6 POSITION 2-SIDED/CURVED/NEO LOW PROFILE ACRYLIC SHOWER TRAY

Position tray against lined wall, mark 4mm above tray upstands, remove tray and trim out lower section of wallboard. Peel off protective tray film. Cut and tape down cardboard tray box to temporarily protect tray surface and cover waste outlet. Fit AquaCheck™ seal to top of tray wall upstands, re-position tray and check end blocks of upstands sit flush with wallboard.

3.7 POSITION 3-SIDED LOW PROFILE ACRYLIC SHOWER TRAY

Position tray against unlined framing, trimming framing where required to achieve finished lining to lining dimension required for tray. Remove tray and peel off protective film. Cut and tape down cardboard tray box to temporarily protect tray surface and cover waste outlet. Fit AquaCheck™ seal to top of tray wall upstands.

3.8 POSITION 3-SIDED STANDARD PROFILE ACRYLIC SHOWER TRAY

Position tray against unlined framing, trimming framing where required to achieve finished lining to lining dimension required for tray. Remove tray and peel off protective film. Cut and tape down cardboard tray box to temporarily protect tray surface and cover waste outlet.

3.9 ADHERE ACRYLIC SHOWER TRAY

Apply construction adhesive to outside & inside of tray underside support rings, sufficient to slump to floor after tray installation. Apply small bead of silicone under outside edge of tray, re-position tray and apply downward pressure. Leave 24 hours minimum before fitting waste.

Installation - acrylic shower liners

3.10 TRIM LINER

Position liner to completed wall lining, check fit of lower edge to tray and outside edges of liner, mark with soft pencil and trim with sharp plane if required. Remove liner, measure plumbing fittings, mark positions on liner and drill holes using a hole saw.

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3.11 ADHERE LINER - LOW PROFILE TRAY

Mark adhesive pattern on wallboard and apply continuous adhesive beads, 30mm in from vertical & top liner edges with vertical lines 75mm apart and horizontal line 20mm above tray AquaCheck™ seal. Apply adhesive bead around plumbing penetrations and rear of side/corner mould. Cover tray end block in adhesive. Position liner on wallboard and, working outwards from inner corner, apply even pressure to liner surface with a roller. Brace liner walls & bottom edge, and leave for 12 hours.

3.12 ADHERE LINER - STANDARD PROFILE TRAY

Mark adhesive pattern on wallboard and apply continuous adhesive beads, 30mm in from vertical & top liner edges with vertical lines 75mm apart and horizontal line 20mm above tray upstand. Apply adhesive bead to top of tray upstand with sufficient thickness to seal to the acrylic liner. Apply adhesive bead around plumbing penetrations, rear of side/corner mould and cover ends of tray upstand in adhesive, 55mm width from each end. Position liner on wallboard and, working outwards from inner corner, apply even pressure to liner surface with a roller. Brace liner walls & bottom edge, and leave for 12 hours.

Installation - ProFinish™ tile-over trays

3.13 POSITION PROFINISH™ SHOWER TRAY - CENTRE WASTE

Drill a small hole at centre of tray, at waste location. Position tray against lined wall and mark tray perimeter & centre point through drilled hole and remove tray. After waste has been fitted to substrate, re-position tray over waste and trim tray using a sharp knife, to fit neatly around waste flange. Trim/sand tray edge to waste flange at low angle.

3.14 POSITION PROFINISH™ SHOWER TRAY - CHANNEL DRAIN

Measure and mark centreline of tray surface on floor (excluding any hobs), along wall edge with channel drain. Position drain template on floor aligned with tray centreline and mark waste centre. After floor water trap has been fitted to substrate, silicone & countersunk stainless steel screw fix leak control flange to substrate and cap screws with silicone. Position channel drain packers either side of leak control flange and trim outside raised ends to suit tray width. Re-position tray and check fit with channel drain. Trim/sand tray edge to waste flange at low angle.

3.15 ADHERE PROFINISH™ SHOWER TRAY - TILE ADHESIVE

Trowel apply tile adhesive to the tray underside and the substrate. Apply bead of MS adhesive to wallboard where tray abuts. Re-position tray and apply downward pressure at wall perimeters, removing all air from below tray. Allow adhesive to cure in accordance with manufacturer's instructions.

Installation - shower wastes

3.16 INSTALL EASY CLEAN CENTRE WASTE

Apply silicone sealant to top of the shower tray waste hole rim. Assemble the inner ring and the base to the shower tray ensuring the rubber seal is in place in the underside. Use the installation tool to hand tighten the unit in place. Do not use excessive force because this will cause distortion of the unit and seal. Remove excess silicone and clean. Remove the installation tool and replace the inner cup rotating the lid and strainer assembly down into position. Ensure Lock Nut is tight when assembled to piping.

3.17 INSTALL CHANNEL DRAIN

Mark the centreline on the floor allowing 10mm for any wallboard not installed to framing. With template, mark the optional waste position, allowing for 10mm wallboard on back wall. Drill 85mm hole in substrate for waste. Trim ends of channel drain packers as required. Fit leak control waste flange to floor waste gully. Bond the waste flange and the channel drain packers to floor prior to waterproofing and tiling. Fit the channel drain into the waste flange.

Installation - doorsets

3.18 FIT GLAZING CHANNELS TO ACRYLIC LINER

Set out and mark vertical glazing channel fixing positions on wall in accordance with doorset installation instructions and pre-drill 2mm lead holes. Apply Sikasil® NG to back of channels and fix in place using provided M4 x 35 screws.

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3.19 FIT GLAZING CHANNELS TO TILED WALLS

Set out and mark vertical glazing channel positions on wall in accordance with doorset installation instructions. Apply Bostick V60 to back of channels and fix in place. Allow a minimum of 24 hours to cure.

3.20 FIT FIXED GLASS PANELS

Fit fixed glass panels into glazing channels in accordance with doorset installation instructions.

3.21 FIT HINGE/PIVOT/SLIDING HARDWARE

Fit hinge/pivot/sliding hardware to fixed glass and tray in accordance with doorset installation instructions.

3.22 ASSEMBLE AND FIT DOOR

Fit door handle and hinge/pivot/sliding hardware to glass door, position and fit to fixed glass panels in accordance with doorset installation instructions.

3.23 SILICONE SEAL

Silicone seal external perimeter of doorset in accordance with installation instructions.

Completion & Commissioning

3.24 COMPLETION MATTERS

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

4 SELECTIONS

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

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7352 TYPE 1 DOMESTIC SMOKE ALARM SYSTEMS

1 GENERAL

This section relates to the installation and commissioning of Type 1 domestic smoke alarm systems.

It includes:

- Power supply
- Associated components to complete the installation

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

dB(A)	A-weighted decibel
VAC	Volts alternating current
VDC	Volts direct current

The following definitions apply specifically to this section:

Heat alarm	Integral device containing heat detector and alarm sounding feature.
Hush-button	Feature that temporarily silences audible alarm signals triggered by conditions resembling a fire i.e. steam or dust but not generated by sources of fire (nuisance alarm).
Smoke alarm	Integral device containing smoke detector and alarm sounding feature.
Type 1	To NZBC C/AS1 Type 1 is a single smoke alarm or multiple interconnected smoke alarm devices each containing smoke detector and alarm sounding feature.

Documents

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC C/AS1	Protection from fire for buildings with sleeping (residential) and outbuildings (risk group SH)
AS/NZS 1125	Conductors in insulated electric cables and flexible cords
AS 1603.17	Automatic fire detection and alarm systems - Warning equipment for people with hearing impairment
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS/NZS 3000	Electrical Installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3808	Insulating and sheathing materials for electric cables
NZS 4512	Fire detection and alarm systems in buildings
NZS 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
BS 5446.3	Detection and alarm devices for dwellings, specification for fire alarm and carbon monoxide alarm systems for deaf and hard of hearing people

Electricity (Safety) Regulations 2010

Requirements

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 TYPE 1 DOMESTIC SMOKE ALARM SYSTEM

Comply with NZBC C/AS1 providing Type 1 domestic smoke alarm system to NZS 4514.



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1.5 NO SUBSTITUTION

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

1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1239 OPERATION & MAINTENANCE for provision of manufacturer's operation and maintenance information as electronic PDF format documents. Documents to include maintenance, checks, tests and replacement requirements to NZS 4514, Maintenance.

Provide this information prior to practical completion.

2 PRODUCTS

Alarm devices

2.1 MULTI-SENSOR SMOKE ALARM

Multi-sensor smoke alarm to NZS 4514 comprising two or more detection technologies i.e. ionisation and photoelectric smoke sensor or photoelectric smoke and heat sensor. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply.

2.2 PHOTOELECTRIC SMOKE ALARM

Photoelectric smoke alarm to NZS 4514 comprising photoelectric smoke detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply.

2.3 HEAT ALARM

Heat alarm to NZS 4514 comprising heat detecting technology. Completed with alarm sounding feature and hush-button. Available wireless with long-life (minimum 10 years), non-removable, sealed battery or hard wired with back-up battery power supply.

Components

2.4 SEALED BATTERY - WIRELESS ALARMS

To NZS 4514, Power Supplies. Long-life (minimum 10 years), non-removable, sealed batteries.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

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

3.3 PRE-INSTALLATION REQUIREMENTS

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

3.4 COMPATIBILITY

Confirm all interconnected devices are compatible.

Installation - generally

3.5 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

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3.6 LOCATION & SPACING

Location and spacing of smoke alarms to NZS 4514. Install smoke alarms within 10m of each other and a maximum of 5m away from any wall.

3.7 AUDIBLE ALARM

Install smoke alarms so that audible alarm sound pressure level when measured at 1.8m height is between 75dB(A) and 110dB(A) to NZS 4514, Alarm Signals.

Installation - smoke alarm system

3.8 INSTALL BATTERIES

Install primary and secondary batteries to NZS 4514 and manufacturer's instructions. Indelibly mark batteries with the date of installation.

3.9 INSTALL ALARMS

Install alarm devices to manufacturer's instructions fitted neatly and without damage to the surrounding finish using brackets and mounts supplied or recommended by the manufacturer.

3.10 INTERCONNECT

Interconnect devices so that when one activates all alarms sound.

Completion & Commissioning

3.11 COMPLETION MATTERS

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

3.12 COMPLETION - TESTS & CERTIFICATION

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

Completed smoke alarm system to be inspected, tested and where required for electrical installations certified to NZS 4514, including (but not limited to):

- Correct location of alarm devices
- Correct sound pressure level of audible alarm signals
- Correct installation to manufacturer's installation instructions
- Correct and fault free operation of the smoke alarm system and interconnected devices

4 SELECTIONS

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

Alarm devices

4.1 PHOTOELECTRIC SMOKE ALARM

Brand:	Orca
Type:	OM866s-10RF (gen2)Smoke alarm
Sensor:	Photoelectric smoke sensor
System:	Wireless
Compliance:	AS 3786

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7411 RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to rainwater disposal systems including spouting and downpipes in:

- metal
- PVC

1.1 ABBREVIATIONS AND DEFINITIONS

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

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Spouting	Roof gutter bracketed off the roof edge or fascia.
Gutter	Internal gutter or gutter formed as integral part of the roof fabric.

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 E1/AS2	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions:

10 Years	For failure of coating adhesion
10 Years	For weatherproofing by material penetration
Form:	Manufacturer's standard warranty form
From:	Commence the warranty from the date of completion of installation

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

1.4 WARRANTY - INSTALLER/APPLICATOR

Warrant this work under normal environmental and use conditions against:

3 years:	For weatherproofing by substandard workmanship:
From:	Commence the warranty from the date of completion of installation
Form:	Installers standard warranty form

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

Requirements

1.5 QUALIFICATIONS

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

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Performance

1.6 TEST

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

2 PRODUCTS

Materials - fascia/barge system

2.1 EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer's requirements.

Components

2.2 DROPPERS

Metal or uPVC droppers, compatible with spouting material and sized to fit inside the downpipe.

2.3 FASTENERS GENERALLY

Minimum Class 4 durability and not less than the roofing material being fixed.

2.4 RIVETS

Sealed aluminium, minimum diameter 4mm.

2.5 SEALANT

MS Polymer sealant.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

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

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 18 metres in length for steel gutter.

3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips. Do not allow copper downpipes to discharge onto lower galvanized or zinc aluminium coated steel roofs.

3.5 INSTALL EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Install concealed fascia brackets to rafters with either screws or nails and fit fascia to a level line. Fit gutter brackets to fall to outlet. Cut and form corner junctions and barge junctions and fit spouting rigidly to brackets. Cut out neatly for and fit pre-formed downpipe droppers. Silicone seal and pop-rivet all lap joints. All installation to NZMRM CoP recommendations.

3.6 INSTALL DOWNPIPE SPREADERS

Install downpipe spreaders where required to NZMRM CoP, clause 5.7.1, **Downpipe Spreaders**. Provide spreaders to downpipes that discharge on to a lower roof. Ensure spreaders do not discharge directly over fasteners or laps. Spreaders to have holes equalling twice the diameter of the downpipe.

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3.7 INSTALL SUMPS

Install sumps where required to NZMRM CoP, clause 5.8, **Sumps**.

3.8 INSTALL RAINWATER HEADS

Install rainwater heads where required to NZMRM CoP, clause 5.8.1, **Rainwater Heads**.

3.9 INSTALL OUTLETS AND OVERFLOWS

Install outlets and overflows where required to NZMRM CoP, clauses 5.8.2, **Outlets and Overflows.**

3.10 INSTALL SUMP PROTECTION

Install leaf guards of the same area as the sump. Set the leaf guard above the calculated level of flow; not directly in the outlet.

Completion

3.11 REPLACE

Replace damaged or marked elements.

3.12 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

3.13 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

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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 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Foul water - Sanitary plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

Stainless steel pipe and associated fittings
PVC,PE polyethylene or polypropylene pipe including all associated fittings.

2.3 FIRE STOPPING SYSTEMS

For sealing around pipe penetration through fire walls and floors use singularly or combinations of the following:

- Gunnable inorganic or silicone elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- Two-part silicone foam elastomer sealant, packed to maintain the specified fire resistance rating of the floor or wall.
- Fire wrap containing intumescent material used in conjunction with the selected sealer.
- Fire collar with intumescent packing to maintain the specified fire resistant rating of the floor or wall.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work to NZBC G13/AS1 and NZBC G1/AS1 and complete all tests to G13/AS1, 7.1 Test Methods.

3.2 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work to AS/NZS 3500.2, as modified by NZBC G13/AS3, and complete all tests to AS/NZS 3500.2, section15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

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3.3 ELECTROLYTIC ACTION

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

3.4 EQUIPOTENTIAL BONDING METALLIC WASTE PIPES

Before enclosing, co-ordinate with electrician to provide for equipotential bonding to ensure metallic waste pipes connected to metallic drains and attached metallic sanitary fixtures using an earth bonding conductor to requirements of AS/NZS 3000, 5.6 Equipotential bonding.

3.5 INSTALL TRAPS, WASTE AND VENT PIPES - NZBC G13/AS1

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13/AS1 and jointing for PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.6 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2, as modified by NZBC G13/AS3, and jointing to PVC-U pipes to AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.7 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.8 FIRE STOPPING WORK

Make and prepare pipe penetration to suit fire stopping and install fire stopping system around pipes to manufacturer's installation instructions.

3.9 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.

3.10 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

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7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS

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

NZBC B1/AS1	Structural provisions for buildings
NZBC E1/AS1	Surface water
NZBC E1/AS2	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC G13/AS2	Foul water - drainage
NZBC G13/AS3	Foul water - sanitary plumbing and drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for concrete
AS/NZS 3500.2	Plumbing and drainage - sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain construction

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 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.

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Components

2.3 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.

Foul water

2.4 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 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.

3.5 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.

3.6 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.

Backfilling and encasement - Foul water and surface water

3.7 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.

3.8 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.

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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.

3.9 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.

4 SELECTIONS

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7553 UNDERFLOOR HEATING MAT SYSTEM

1 GENERAL

This section relates to the supply and installation of electric underfloor heating mats and control systems for domestic commercial or industrial applications installed:

- on a thin adhesive bed on top of a concrete or timber floor
- under timber overlay floors
- under floor tiles

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations are used in this specification.

UFH	Under Floor Heating

Documents

1.2 DOCUMENTS

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

NZBC G9/VM1	Electricity
NZS 6110	Electrical installations - floor and ceiling heating systems
AS/NZS 60335.2.96	Household and similar electrical appliances - Safety - Particular requirements for flexible sheet heating elements for room heating

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide the manufacturer warranty.

10 years	For heating mat under tiles and timber overlay
5 years	For heating mat under carpet
2 years	For thermostats

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.5 QUALIFICATIONS WORKERS – MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be approved / accredited / registered / licensed / certified by manufacturer / supplier.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.6 QUALIFICATIONS WORKERS – INDUSTRY QUALIFICATION REQUIREMENTS

Where workers or supervisors of work are required to be trained / licensed / certified or similar under applicable industry rules.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any of the selected manufacturer UFH system, associated products, components or accessories.

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1.8 COMPLY

Comply with NZBC G9/VM1, NZS 6110 Electrical installations - floor and ceiling heating systems, and AS/NZS 60335.2.96 Household and similar electrical appliances - Safety - Particular requirements for flexible sheet heating elements for room heating.

2 PRODUCTS

Materials - heating mat

2.1 HEATING MAT

Heating cables consist of multi strand single insulated conductors, full earth screen and with a waterproof protective outer PVC insulation. Heating cables are attached onto an open weave mesh mat.

Materials - thermostat controls

2.2 SWITCHBOARD MOUNTED MANUAL ELECTRONIC THERMOSTAT

Switchboard mounted thermostat with remote sensor. Refer to SELECTIONS for option.

2.3 MANUAL ELECTRONIC THERMOSTAT

Thermostat, flush box mounted.

Thermostat, surface mounted.

2.4 DIGITAL TIMER THERMOSTAT

Digital timer thermostat with three functions in one, floor sensing, room sensing, or a combination of the two.

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 GENERALLY

All work and materials to comply with the manufacturer's installation instructions.

3.4 CONFIRM LAYOUT

Before commencing work confirm the proposed location of heating mats and controls.

3.5 CO-ORDINATE SERVICES

Co-ordinate and co-operate with other sub-trades to avoid any conflict with the installation of the system with other subcontractors work.

Application - general

3.6 PRELIMINARY WORK

Ensure all walls (where required) and floor penetrations are clearly marked.

Installation - heating mat

3.7 PRELIMINARY WORK

The floor is to be cleaned and primed prior to the installation of the heating mat. All fixings such as door stops and floor mounted cabinetry to be clearly marked out on the floor.

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3.8 INSTALL HEATING MAT

Install the heating mat to manufacturer's instructions ensuring as much of the floor area is covered in each of the zones shown on the plan / schedule.

3.9 COLD TAIL CONNECTIONS

Terminate all cold tails in a flush box mounted approximately 300 mm above F.F.L.

3.10 CONNECTION TO POWER SUPPLY

Connect from wall mounted flush box to power supply protected by an RCD. Refer to the appropriate electrical section for electrical connections of the heating mats.

Installation - thermostat controls

3.11 THERMOSTAT INSTALLATION

Install and connect all thermostat and controls as per the schedule and type listed in SELECTIONS.

3.12 INSTALL THERMOSTAT SENSORS

Install thermostat sensors for each zone as per the schedule. Install sensors within a conduit so they are easily replaced after completion. For a timber floor install the sensor higher than the heating cables / directly under the flooring.

3.13 TEST ALL ELEMENTS

All elements to be tested for continuity, resistance and insulation resistance prior installation of flooring, and after installation and prior to livening. Fill out the pre and post floor placement test result sheets and forward these results to the owner. It is recommended that all elements are tested at prewire stage of the installation.

3.14 TEST AND ACTIVATE ALL CONTROLS

All thermostats to be activated and checked for correct operation. Where programmable or intelligent thermostats are installed the correct day and time to be programmed in. Once these thermostats have been checked, leave in manual and off unless instructed otherwise.

Completion & Commissioning

3.15 COMPLETION MATTERS

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

3.16 COMPLETION - TESTS & CERTIFICATION

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

4 SELECTIONS



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7612 RESIDENTIAL EXTRACT SYSTEMS

1 GENERAL

This section relates to the supply and installation of extract systems for residential applications. It includes:

- Kitchen extract systems
- Bathroom and laundry extract systems

Documents

1.1 DOCUMENTS

The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC E3/AS1	Internal moisture
NZBC G4/AS1	Ventilation of buildings
NZBC G9/VM1	Electricity

Electricity (Safety) Regulations 2010

Requirements

1.2 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.

1.3 QUALIFICATIONS GENERALLY

Refer to 1270 CONSTRUCTION for requirements relating to qualifications.

1.4 ELECTRICAL QUALIFICATION

Registered electrician to carry out work to Electricity (Safety) Regulations 2010.

1.5 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

1.6 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 EXTRACT - TO ROOF

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filter, lighting, controls, metal ducting, proprietary roof flashing and cowl.

2.2 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL / SOFFIT

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filters, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.

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2.3 KITCHEN POWERPACK EXTRACT SYSTEM - DUCTED TO ROOF

Mechanical extract system installed in overhead cabinetry comprised of powerpack componentry, extract fan, filter, lighting, controls, metal ducting, proprietary roof flashing and cowl.

2.4 KITCHEN POWERPACK EXTRACT SYSTEM - DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical extract system installed in overhead cabinetry comprised of powerpack componentry, extract fan, filter, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.

Bathroom and laundry extract systems

2.5 ROOF / CEILING MOUNTED FAN DUCTED TO ROOF

Mechanical venting system comprised of ceiling diffuser, extract fan, filter, controls, metal ducting, proprietary roof flashing and cowl.

2.6 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical fan ducted system comprised of ceiling fan, filters, controls, aluminium foil flexi ducting joined to a solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

Component

2.7 ELECTRICAL FAN SWITCH

Independent switch connected to socket outlet located near fan / unit.

3 EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

Installation - mechanical ventilation

3.3 INSTALL KITCHEN RANGEHOOD

Install rangehood to NZBC G9/VM1 and manufacturer installation instructions. Connect unit with ducting to exit either through roof or exterior wall / soffit. Plug into electrical socket.

3.4 INSTALL KITCHEN POWERPACK EXTRACT SYSTEM

Install powerpack extract system to NZBC G9/VM1 and manufacturer installation instructions. Connect unit with ducting to exit either through roof or exterior wall / soffit. Plug into electrical socket.

3.5 INSTALL BATHROOM / TOILET / LAUNDRY EXTRACT FANS

Install exterior ducted fans to manufacturer requirements to NZBC G9/VM1 and NZBC G4/AS1. Duct through to roof or exterior wall / soffit. Plug into electrical socket.

3.6 INSULATION CLEARANCE

Provide 50mm clearance between insulation and motor unit / electrical enclosure. Insulation can abut ducts.

3.7 ELECTRICAL INSTALLATION

Install switch and socket outlets to NZBC G9/VM1. Refer to electrical section(s) for requirements.

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Completion & commissioning

3.8 COMPLETION MATTERS

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

3.9 COMPLETION - TESTS & CERTIFICATION

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

3.10 COMMISSIONING - TESTS & CERTIFICATION

Refer to 1270 CONSTRUCTION for general test and certification requirements for commissioning.

4 SELECTIONS



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7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AFDD	Arc Fault Detection Device
COC	Certificate of Compliance
ELV	Extra Low Voltage
IP	international (ingress) protection classification
MCB	Miniature circuit breakers
NUO	Network Utility Operator
PCB	printed circuit board
RCCB	Residual Current-operated Circuit Breaker
RCD	Residual Current Device
SIA	security integration architecture
TCF	Telecommunications Carriers' Forum

Documents

1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture provisions for timber-framed buildings up to 10 m in height
NZBC F6/AS1	Visibility in escape routes
NZBC F8/AS1	Signs
NZBC G4/AS1	Ventilation of buildings
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1:2005	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3:2005	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 2648.1	Underground marking tape - Non-detectable tape
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3111	Approval and test specification - Miniature overcurrent circuit-breakers
AS/NZS 3112:2017	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses

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NZS 3604	Timber framed buildings
NZS 4246	Energy Efficiency - Installing bulking thermal insulation in residential buildings
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60898	Electrical accessories - Circuit-breakers for overcurrent protection for household and similar installations - Series
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance.
AS/NZS 61439.3	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
IEC 61008.1	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) - Part 1: General rules
IEC 61009.1	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) - Part 1: General rules
IEC 61643	Components for low voltage surge protection devices
IEC 62423	Type F and type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses
IEC 62606	General requirements for arc fault detection devices

Electricity (Safety) Regulations 2010
NZ Telecommunications Forum (TCF) Premises Wiring Guidelines
Private Security Personnel Investigations Act 2010

Requirements

1.3 COMPLY

Comply with the Electricity (Safety) Regulations 2010, AS/NZS 3000, AS/NZS 3008.1.2, and TCF Premises Wiring Guidelines for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

1.4 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

Electrical workers holding a current Practising Licence (with an appropriate Registration class) to carry out prescribed electrical work. An Electrical Worker who holds a Trainee Limited Certificate or a Limited Certificate to be supervised by a licensed electrical worker with an appropriate Registration class.

Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

1.5 CONFIRM SELECTIONS

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

1.6 ELECTRICAL CERTIFICATE OF COMPLIANCE

At the completion of electrical work provide a Certificate of Compliance (CoC) to Electricity (Safety) Regulations 2010, regulation 65-67. Provide a copy to the Contract Administrator and NUO prior to connection and when required to the BCA for Code Compliance.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect high risk electrical work as required by Electricity (Safety) Regulations 2010, regulation 70 High-risk prescribed electrical work to be inspected.

1.7 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electricity (Safety) Regulations 2010, Reg 74A, to the Contract Administrator and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

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2 PRODUCTS

2.1 MAINS SUPPLY

Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0mm², and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm² on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm² on 16 amp MCBs
Power circuits:	2.5mm² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm² on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm² on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm² high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.4 DISTRIBUTION BOARD

Flush surface mount boards manufactured to AS/NZS 61439.3, and installed in accordance with AS/NZS 3000, 2.10 Switchboards. Complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.5 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A to AS/NZS 3000, 2.3.3 Main Switches and additional isolating switches to AS/NZS 3000, 2.3.4 Additional isolating switches.

Residual current protection, maximum sensitivity of 30mA, to AS/NZS 3000, 2.6 Additional Protection by Residual Current Devices, as modified by Electricity (Safety) Regulations 2010. RCD and RCCBs' to meet Type A to IEC 61009.1 / IEC 61008.1 or Type F or Type B RCD to IEC 62423.

Miniature Circuit Breakers (MCB) to AS/NZS 60898 series or AS/NZS 3111, 4.5kA domestic or 6kA for commercial.

2.6 SURGE PROTECTION

Provide surge protection device(s) to AS/NZS 3000, Appendix F Surge Protection Devices. Protection for the home's appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.

2.7 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.

2.8 SWITCH UNITS

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Single pole switches to be 10 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units.
Label all switch units that control electrical equipment or special lighting circuits by proprietary engraved switch mechanisms where applicable.
Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.
Refer to SELECTIONS.

2.9 SWITCHED SOCKET UNITS

To AS/NZS 3000, 4.4 Socket-Outlets, 10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters to AS/NZS 3112 clause 3.12 as modified by Electricity (Safety) Regulation, single or multi gang as detailed. Refer to SELECTIONS.

2.10 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.

2.11 HOT WATER SYSTEM ISOLATION SWITCH

To AS/NZS 3000, 4.8.2 Water heaters, one way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.12 BATTEN HOLDERS

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

2.13 LIGHT FITTINGS

To AS/NZS 3000, 4.5 Lighting Equipment and Accessories and if required, complete with lamps and, if required, transformer and control gear for dimming. Refer to SELECTIONS.

2.14 RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to AS/NZS 3000, 4.5.2.3.5:

- Existing fittings or retrofit situations, fittings maybe unmarked.
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F, & IC-4.

Refer to SELECTIONS.

2.15 EXTERIOR SWITCHES AND SWITCHED SOCKET UNITS

Exterior grade, weather protected, switches and sockets to IP56 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on. Refer to SELECTIONS.

2.16 EXTERIOR LIGHT FITTINGS

Using materials with superior UV protection, impact strength, and addition chemical resistance.

Weather protection minimums:

- IP54 for protected areas under eaves or verandahs etc.
- IP55 for exposed areas not subject to pressurised water (hoses).
- IP66 for areas subject to pressurised water or major splashing.
- IP67 for inground lights
- IP68 for submerged pool fittings

Refer to SELECTIONS.

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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Installation

3.3 MAIN SUPPLY

Lay underground mains to the NUO and AS/NZS 3000, 3.11 Underground Wiring Systems requirements. Excavate trench, ensure minimum depth of cover to AS/NZS 3000 Table 3.6 Under-Ground Wiring Systems - Minimum Depth of Cover, install cable and marker tape complying with AS/NZS 2648.1 and backfill. If required, provide permanent cable marker signs to indicate the point where a cable enters or leaves a structure.

3.4 METER BOX

Fit to meter box manufacturer and Electricity Retailer requirements. Recess into external wall in sheltered area and flash to weatherproof to NZBC E2/AS1, Figure 9.1.8.3B: General meterbox and similar penetrations. Arrange for meter installation and connection.

3.5 DISTRIBUTION BOARD

Fit to AS/NZS 3000, 2.10 Switchboards and board manufacturer requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

3.6 CIRCUIT BREAKERS

Install MCBs at distribution board to AS/NZS 3000 to protect each final sub circuit.

3.7 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

3.8 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to AS/NZS 3000, 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer requirements.

If they form part of the building, this includes:

- Conductive water piping (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). Not required where isolated by non-conductors (plastic pipe etc) from the mass of earth.
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

3.9 MAIN EARTH

Install main earthing conductor to AS/NZS 3000, 5.5.1 Main Earthing conductor. Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.10 ARC FAULT DETECTION DEVICE (AFDD)

To AS/NZS 3000 clause 2.9, AFDD on all final sub-circuits not exceeding 20A. Install to AS/NZS 3000, Appendix O, Installation of Arc Fault Detection Devices (AFDD'S)

3.11 SURGE PROTECTION

Install surge protection devices to manufacturer requirements and in accordance with AS/NZS 3000, Appendix F, F1.2.2 Installation.

3.12 RCD - RESIDENTIAL INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets (except for fixed or stationary cooking equipment), lighting & directly connected handheld electrical equipment, to AS/NZS 3000, 2.6.3.3.1 Residential installations - New Zealand only.

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3.13 RCD - DAMP SITUATIONS

Install 30-mA RCD protection as required to AS/NZS 3000, section 6 for damp situations, including in the following higher risk areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.

3.14 SET-OUT - OUTLETS & EQUIPMENT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.15 CABLING

Install wiring systems to AS/NZS 3000, Section 3 Selection and Installation of Wiring Systems. All cabling run concealed fix in position by suitable clips, saddles or clamps. Where possible, run cabling horizontally / vertically in straight line.

Locate holes in timber framing for the passage of cables at the centre line of member ensuring structural strength in maintained to NZS 3604 requirements. In steel studs/ structural steel, ensure aperture is brushed and shaped to minimize abrasion of cable. Cables may be supported by suspended ceiling systems unless not permitted by suspended ceiling manufacturer. Install cable in conduits where required to pass through concrete or underground.

3.16 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.

3.17 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.18 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.

3.19 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the Contract Administrator, when not specifically shown on the drawings.

3.20 LIGHT FITTINGS

Install light fittings in locations and at heights as confirmed by the Contract Administrator, when not specifically shown on the drawings. Install to the luminaire manufacturer's requirements (including clearances) and to AS/NZS 3000, 4.5 Lighting Equipment & Accessories, in correct orientation for light output, complete with lamps.

Fix through linings to structure or framing, provide additional nogs, trim and packing if required. Ensure transformers/drivers and luminaires are adequately ventilated and clear of any building elements, to AS/NZS 3000.

3.21 EXTRA LOW VOLTAGE LIGHTING

Install extra-low voltage lighting to AS/NZS 3000, 7.5 Extra-Low Voltage Electrical Installations and fitting manufacturer's requirements.

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to AS/NZS 3000.

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3.22 INSULATION CLEARANCES

Refer to relevant INSULATION section.

3.23 ELECTRIC HOT WATER SYSTEM

Install to manufacturer's requirements and to AS/NZS 3000, 4.8.2 Water heaters. Wire as a separate circuit through a wall-mounted, lockable, isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.24 OUTDOOR/EXTERIOR SERVICES

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems, in accordance with AS/NZS 3000 and the fixture/fitting manufacturer's recommendations.

Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services to AS/NZS 3000, 3.11 Underground Wiring Systems.

Use the appropriate rated fittings for power control and power supply. Weather protected switches and sockets to IP56 minimum. Install to manufacturer specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet.

3.25 LABELLING

To AS/NZS 3000, 2.10.5 Equipment identification, include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Completion & Commissioning

3.26 COMPLETION MATTERS

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

3.27 COMPLETION - TESTS & CERTIFICATION

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

Testing:	To Electricity (Safety) Regulations 2010 and AS/NZS 3000, 8.3 testing
Certificate of Compliance:	To Electricity (Safety) Regulations 2010 and ensure Verification Records supplied to AS/NZS 3000, clause 8.4

4 SELECTIONS

Materials

4.1 FIRE & SMOKE ALARM SYSTEM

Refer to appropriate fire and smoke alarm section:

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8110 RETAINING WALLS

1 GENERAL

This section relates to the supply and erection of proprietary, fabricated, retaining wall systems.

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

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

1.2 DOCUMENTS

The following documents are specifically referred to in this section:

NZS 3104	Specification for concrete production
NZS 3602	Timber and wood-based products for use in building
NZS 3605	Timber piles and poles for use in buildings
AS/NZS 4455.3	Masonry units, pavers, flags and segmental retaining wall units - Segmental retaining wall units
AS/NZS 4671	Steel reinforcing materials

1.3 QUALIFICATIONS

Carry out retaining wall work using competent, experienced people, familiar with the materials and techniques specified.

2 PRODUCTS

2.1 CONCRETE

Prescribed mix to NZS 3104, minimum 17.5 MPa. Maximum aggregate size 10mm.

Timber retaining walls

2.2 TIMBER ELEMENTS

Radiata pine CCA (preservative code 01 or 02) treated, to NZS 3602, table 1A, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 TIMBER POLES

Radiata pine, selected in accordance with NZS 3605, treated H5 CCA (preservative code 01 or 02) to NZS 3602 table 1A, Requirements for wood-based building components to achieve a 50-year durability performance and to NZS 3605 for cross-section, length, straightness and strength branding. Do not put cut ends into ground. Treat all cut ends or notches with a liberal brush coat of copper napthenate or equivalent wood preservative before sealing with a bituminous sealer.

General accessories

2.4 FIXINGS, BOLTS AND CONNECTORS

Hot-dip galvanized steel or Stainless steel if the timber is CCA (preservative code 01 or 02) treated.

Only stainless steel to be used if 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).

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3 EXECUTION

3.1 STORAGE

Take delivery of retaining wall elements in protected pallets, undamaged and dry. Store on level hard standings, protect from damage and keep dry until laid.

Timber retaining walls

3.2 ERECT DRILLED TIMBER POLE WALLS

Excavate, drill to required depth, and set in concrete in pre-drilled holes, and erect planks; all in accordance with the pole wall manufacturer's requirements and standard details. Place poles butt end down. Install timber rails with staggered joints. All rail joints close butted at poles.

Set-out tolerances

From pole centre line:	Maximum 60mm from centre line
Misalignment:	Maximum 20mm at retaining face
Minimum back slope:	3 degrees back slope from vertical
Drill diameter:	Pole butt end diameter + 100mm
Min concrete encasement:	25mm over the timber pole

Ground water drainage

3.3 GROUND WATER DRAINAGE

For retaining wall drainage and backfill refer to 7430 DRAINAGE.

Completion

3.4 TAKE AWAY

Take away from the site plant and material not used.

4 SELECTIONS



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