

# Approved Building Consent Documents

**Please Note: A copy of the stamped approved documents must be available on site for all inspections.**

## Inspection booking timeframes

Call received	before 3pm inspection will be done	after 3pm inspection will be done
Monday	Wednesday	Thursday
Tuesday	Thursday	Friday
Wednesday	Friday	Monday
Thursday	Monday	Tuesday
Friday	Tuesday	Wednesday

Building inspections and enquiries phone: 03 347 2839

**Please ensure all work for inspection is ready the day before. Incomplete work requiring re-inspection will incur an additional inspection fee.**

## SPECIFICATION

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

### **43 Nicolau Avenue**

#### **Project Specification**

43 Nicolau Avenue, Rolleston, Christchurch, New Zealand  
Project Ref: 21151

Printed: 21 July 2022



**masterspec**

Specification built using Masterspec software  
Project ID: 259283 - 273889



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1013 DOCUMENT CONTROL

1 DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Choice Architecture
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# 1233 REFERENCED DOCUMENTS

## 1 GENERAL

### 1.1 REFERENCED DOCUMENTS

Throughout this specification, reference is made to various [New Zealand Building Code Compliance Documents \(NZBC\)](#), acceptable solutions (AS) and verification methods (VM) for criteria and/or methods used to establish compliance with the [New Zealand Building Code](#).

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

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

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

### 1.2 DOCUMENTS

Documents referred to in the GENERAL sections are:

<a href="#">NZBC F5/AS1</a>	Construction and demolition hazards
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">NZS 1170.5</a>	Structural design actions - Earthquake actions - New Zealand
<a href="#">AS/NZS 3012</a>	Electrical installations - Construction and demolition sites
<a href="#">NZS 3109</a>	Concrete construction
<a href="#">NZS 3114</a>	Specification for concrete surface finishes
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4781</a>	Code of Practice for Safety in Welding and Cutting
<a href="#">NZS 6803</a>	Acoustics - Construction Noise
<a href="#">Building Act 2004</a>	
<a href="#">Building Regulations 1992</a>	
<a href="#">Health and Safety at Work Act 2015</a>	
<a href="#">Health and Safety at Work (General Risk and Workplace Management) Regulations 2016</a>	
<a href="#">Health and Safety at Work (Hazardous Substances) Regulations 2017</a>	
<a href="#">Health and Safety in Employment Regulations 1995</a>	
<a href="#">New Zealand Building Code</a>	
<a href="#">Heritage New Zealand Pouhere Taonga Act 2014</a>	
<a href="#">Resource Management Act 1991</a>	
<a href="#">Smoke-free Environments Act 1990</a>	
<a href="#">WorkSafe NZ</a>	Guidelines for the provision of facilities and general safety in the construction industry
<a href="#">WorkSafe NZ</a>	Good Practice Guidelines - Excavation Safety
<a href="#">WorkSafe NZ</a>	Scaffolding in New Zealand - Good Practice Guidelines

## 1234 DOCUMENTATION

### 1 GENERAL

This general section relates to documentation required by the Territorial Authority / Building Consent Authority for compliance with the [New Zealand Building Code](#). It also includes documentation relating to:

- Substitutions
- Manufacturers' documents
- Branded work sections
- Care of construction documents
- Confidentiality of documents
- Receipt of construction documents

#### Building Consent Authority documentation

##### 11 BUILDING CONSENT

Obtain the original building consent forms and documents from the owner and keep them on site, preserve the condition of consent forms and documents. Liaise with the building consent authority for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

##### 12 BUILDING CONSENT COMPLIANCE

It is an offence under the [Building Act 2004](#)

- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction and then if required to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the contract administrator for direction.

##### 13 PROJECT PERSONNEL

Provide names and contact details of the contractor's key personnel and tradespersons who are involved with the project. Review the list once a month and reissue it if changes have been made.

#### Licensed Building Practitioner documentation

##### 14 LICENSED BUILDING PRACTITIONERS

Provide LBP details. Provide names, LBP numbers, areas of practice and contact information.

Provide this information to the BCA before commencing work on the Restricted Building Work in the form required by the BCA. Advise the BCA of any change to an LBP previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Bricklaying
- Roofing 2 Profiled metal roofer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered electrician

##### 1.5 RECORD OF WORK

Where Restricted Building Work is carried out by a LBP, on completion provide a Record of Work. Provide copies to both the BCA and the Contract Administrator.

#### Compliance information

##### 1.6 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE

Information may be required either as a condition of the contract documents or as a condition of the building consent. It may include the following:

- Applicators approval certificate from the manufacturer / supplier
- Manufacturer's / supplier's warranty
- Installer / applicator's warranty
- Producer Statement (PS1) - Design
- Producer Statement (PS3) - Construction from the applicator / installer
- Producer Statement (PS4) - Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the BCA.

#### PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the Contract Administrator. Provide producer statements in the form required by the BCA.

### Residential building contract

#### CHECKLIST

If requested provide evidence of the prescribed checklist given to the residential client.

#### DISCLOSURE STATEMENT

If requested provide evidence of the disclosure statement given to the residential client.

#### BUILDING CONTRACT

If requested provide evidence of the written building contract that the residential customer has signed.

#### DOCUMENTATION REQUIRED ON COMPLETION

As soon as practicable after completion of the building work, provide in writing the following information and documentation to the client and the relevant territorial authority.

Information and documentation relating to:

- The identity of the building contractor and the subcontractors who carried out the work.
- Maintenance requirements for any products incorporated in the building.

If applicable also provide any guarantee or insurance obtained by the building contractor in relation to the building work.

### Substitutions

#### 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.

#### NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified products and systems listed in a section unless specified otherwise. If a product is not available then immediately contact the contract administrator for direction.

#### PROPOSED SUBSTITUTIONS

Substitution of products or systems contained within branded work sections is not allowed. The contractor may propose substitutions to products within non branded work sections, when the contractor has determined that the proposed substitution is an alternative to the specified product. The Contract administrator is not bound to accept any substitutions. Submit a draft proposal detailing the substitution to the contract administrator before proceeding with full notification.

#### 1.15 NOTIFICATION OF SUBSTITUTIONS



Notify the contract administrator of proposed substitution of specified products. Notification to include but not be limited to:

- Product identification
- Manufacturer's name, address, telephone number, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of **NZBC** compliance including durability
- Details of manufacturer warranties

Plus an assessment of:

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Any effect the substitution may have on Health & Safety requirements
- Allowance for time and cost for re-design and documentation (if applicable)
- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested:

- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

#### 1116 ACCEPTANCE OF SUBSTITUTIONS

Acceptance of any proposed substitutions will be given in writing by the contract administrator.

### Amendments to issued Building Consent

#### 1117 CONTRACTOR AMENDMENTS TO BUILDING CONSENT

Where the contractor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:

- Obtain approval for substitutions from the contract administrator.
- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

#### 1118 PRINCIPAL AMENDMENTS TO BUILDING CONSENT

Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:

- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

### Manufacturer's documents

#### 1119 MANUFACTURER'S AND SUPPLIER'S INSTALLATION REQUIREMENTS

Manufacturer's and supplier's requirements, instructions, specifications or details mean those issued by them for their particular product, material or component and are the latest edition.

#### 1.20 CONTRACTOR TO OBTAIN CURRENT DOCUMENTATION

Where manufacturer's installation, application and execution requirements are referred to in this specification, the Contractor must ensure they are fully aware of this documentation. Whenever necessary obtain and keep on site the relevant latest version of such documentation and make it available to workers carrying out that part of the work.

#### 1.21 DOCUMENTATION PROVIDED FOR BUILDING CONSENT

Documentation including manufacturer’s installation instructions, specification data sheets, producer statements, BRANZ and similar appraisals may be included in the issued Building Consent. These documents have been provided only to demonstrate compliance with the NZBC.

**Branded work sections**

1.22 **BRANDED PRODUCTS / SYSTEMS**

Where branded products and systems are specified, all products and components of the system must be as per the specification.

1.23 **CROSS REFERENCED WORK SECTIONS**

If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the contract administrator if there is any doubt.

**Care of construction documents**

1.24 **CONSTRUCTION ISSUE**

Take receipt of the plans, specifications and other documents issued “for construction”. Keep at least one copy on site available for use by all on site workers. Keep a record of copies provided to others including subcontractors. Protect the documents as appropriate. Obtain replacement copies for documents that have become damaged.

1.25 **REVISIONS TO CONSTRUCTION ISSUE**

Where revised plans and other documents are issued ensure that superseded documents are deleted from the working sets. Ensure that subcontractors are provided with amended documents. Delete superseded documents by either:

- removing them from the working copy of the construction issue; or
- marking them as superseded

1.26 **RETURN DOCUMENTS ISSUED FOR CONSTRUCTION**

On completion of the contract works:

- Keep such copies of the plans, specification and other documents as reasonably required for contractor’s record purposes.
- Retrieve all other copies no longer required by parties.
- Agree method of disposal of such documents with the Contract Administrator.

The Contract Administrator will advise whether such documents shall be:

- delivered to the Contract Administrator/Owner; or
- disposed of by normal waste disposal methods; or
- disposed of by secure document disposal methods.

**Confidentiality of documents**

1.27 **CONFIDENTIALITY OF DOCUMENTS**

Documents shall not be given or copied to others who do not require them for carrying out services required for the construction of the works. Documents are only to be used for the contract. Maintain confidentiality of documents.

**SELECTIONS**

**Receipt of construction documents**

2.1 **INITIAL ISSUE & REVISIONS - HARD COPIES**

Initial issue: 1 at full size  
Revisions: 1 at full size

2.2 **DOCUMENT RECEIPT - HARD COPIES**

Hard copies of plans, specifications and other documents issued for construction shall be supplied by contractor

2.3 **DOCUMENT RECEIPT - ELECTRONIC DOCUMENTS**

Electronic documents issued for construction shall be Obtained as an email attachment sent to an agreed address



# 1237 WARRANTIES

## 1 GENERAL

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

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

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

### 11 SCHEDULE SECTION

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

## 12 Warranties

### 12 PROVIDE WARRANTIES

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

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

### 13 WARRANTIES - INSTALLER/APPLICATOR

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

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

### 14 WARRANTIES - MANUFACTURER/SUPPLIER

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

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

## Submission

### 1.5 REVIEW BY CONTRACTOR

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

1.6

**WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY**

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

1.7

**WARRANTIES - REQUIRED BY CONTRACT**

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

1.8

**WARRANTIES - SUBMISSION NZS3902:2004 CONTRACT**

Refer to [NZS 3902](#) Housing, alterations and small buildings contract. Submit warranties to the owner no later than the time the builder gives Notice of final completion to the owner.

**SELECTIONS**

**Project warranties / guarantees**

**Guarantees - Contractor - Master Build Services Ltd**

2.1

**MASTER BUILD SERVICES LTD - 10 YEAR STANDARD GUARANTEE**

Provide a 10 Year Standard Guarantee (including all optional cover), include all costs in the contract price. Detach the guarantee application form from the guarantee agreement. Complete the form, obtain all required signatures (builder and owner). Send the completed form to Master Build Services for approval along with a copy of the building contract (include a full scope of work for any addition/alteration work), prior to any work commencing. Obtain the Master build Services acceptance letter and provide this to the owner along with the guarantee document. On completion of the building work complete the notice of practical completion form, obtain all required signatures (builder and owner) and forward the form to Master Build Services.

**Weathertightness and watertightness warranty**

2.2

**WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY**

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

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

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

## 1240 ESTABLISHMENT

### 1 GENERAL

This general section relates to site establishment including:

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

#### Notices and approvals

##### 11 STATUTORY OBLIGATIONS

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

##### 12 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

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

##### 13 NOTIFY NETWORK UTILITY OPERATORS

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

#### Inspections

##### Site preparation

##### 14 SITE ACCESS

Access to the site is limited to: Refer to site plan

##### 15 WORKING AREA

Limited to the following designated working areas on the site:  
Refer to site plan

##### 16 SITE AND SOIL SURVEYS

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

#### Temporary construction

##### 17 TEMPORARY BUILDINGS

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

##### 18 TEMPORARY SITE FENCING

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

##### 19 SITE - SAFETY SIGNAGE

Provide hazard board and other safety signage as required.

#### First aid

##### 1.10 FIRST AID EQUIPMENT

Provide first aid equipment.

## 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

##### 11 COSTS RELATING TO TEMPORARY WORKS

Pay all rates/fees in respect of temporary works.

##### 12 MAINTENANCE OF TEMPORARY WORKS

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

##### 13 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.

##### 14 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

##### 15 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

#### Scaffolding

##### 16 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

##### 17 WATER

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

##### 18 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.

Care and protection - Project

1.9 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.

1.10 SPECIAL PROTECTION GENERAL

Refer to individual work sections for any special protection requirements.

Care and protection - miscellaneous

1.11 CONSTRUCTION KEYING AND SECURITY

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

1.12 TEMPORARY STORAGE

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

Rubbish removal

1.13 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.



# 1260 PROJECT MANAGEMENT

## 1 GENERAL

This general section relates to project management requirements including:

- Meetings
- Reporting
- Communicating and records
- Confidentiality
- Working hours
- Health and safety

### Site Meetings

#### 11 PURPOSE OF SITE MEETINGS

The purpose of site meetings is to:

- Ensure that the Contractor has all information required to construct the work
- To address and clarify aspects of construction of the work including quality
- To address issues relating to project delivery including, site progress and cost.

#### 12 SITE MEETING ATTENDANCE

The following persons to attend:

- Contractor
- Designer
- 

#### 13 REPORTING

The following reports are required to be presented at site meetings:

Contractor: A detailed status report

#### 14 SITE MEETING MINUTES

The contract administrator is to keep full minutes of all site meetings and arrange distribution to all those involved within 3 working days.

The minutes are to record

- Documentation and information issued and required
- Directions and variations issued
- Confirmation of contract insurances
- Programme items
- General business
- Site health and safety
- Payment claim processing including costing variations

### Reporting

#### 15 CONTRACTORS DETAILED STATUS REPORT

A contractor's detailed status report is to address the following:

- Progress performance, addressing actual progress against the programme and any variance from the programme.
- Procurement progress on parts of the work being undertaken under a monetary allowance including the time by which direction must be given on monetary allowances to conform to the programme.
- Details of measures being taken to get work back on programme where there has been a delay and details of any future events that will or are likely to affect compliance with the programme.
- Compliance with the issued Building Consent and notification of any work or inspections that have not been passed by the BCA inspector.
- Compliance with the issued Resource Consent and any compliance issues.
- Site health and safety including any notifiable incidents.
- Details of any discrepancies in the contract documents that require clarification or determination
- A list of information requests by the contractor, the date when they were made, the person who they were directed to and the date by which a response is required.
- A variation report including progress on agreed variations, variations to be agreed and

- anticipated variations and the time implication of variations.
- Variation costing and the adjusted contract price including an assessment of the cost of known and potential variations.
  - Review of sums not yet directed for expenditure.

**Cost control**

1.6 MEASUREMENT

Give reasonable notice to the contract administrator before covering up work which requires to be measured.

1.7 DAYWORK VOUCHERS

To be signed by the contractor's representative as confirming the labour, times and materials used, before being supplied to the contract administrator.

**Communicating and records**

1.8 MEANS OF COMMUNICATION

Communications between the parties shall be as follows:

Directions: In writing delivered by email with a copy by post or hand  
Meeting minutes: In writing delivered by email  
RFI's: (Requests for information) by email or in writing to the contract administrator

1.9 DELIVERY OF COMMUNICATIONS

Deliver communications to the addresses listed in the contract agreement by means as allowed. Where such addresses are not included in the contract agreement:

- deliver to the addressee by hand; or
- post to the postal address stated in the project directory; or
- deliver to the street address as stated in the Project Directory; or
- send by email to the email address stated in the Project Directory; or
- where agreed, deliver via a file hosting service or an electronic project management system.

1.10 SERVICE OF NOTICES

Serve notices to the addresses listed in the contract agreement by means as allowed.

1.11 CHANGE OF ADDRESS

The principal, contractor and the contract administrator must notify the others if they change their address for delivery or transmission of communications.

1.12 RECORDS

Ensure all records specified are kept, held and collated on site in a form that makes the information easily accessible when it is needed. Distribute copies as and when necessary to those persons entitled under the contract to that information.

1.13 EXISTING STRUCTURES PHOTOGRAPHS

Before commencing work take digital photographs recording existing conditions of existing buildings and structures, including adjacent areas that may be affected by the carrying out of the contract works. Include adjacent roadways and footpaths and neighbouring buildings and the like. Where there is existing damage to adjacent buildings and/or structures, ensure that the photographs adequately record the extent of the damage or failure. Refer to SELECTIONS.

1.14 PROGRESS PHOTOGRAPHS

Take digital photographs recording progress. Refer to SELECTIONS.

**Confidentiality**

1.15 CONFIDENTIALITY - PUBLICITY

Unless specifically agreed photographs and other images of the work are not to be used by the contractor, subcontractors, material suppliers and others involved in the construction of the works.

Photographs taken for record purposes may be kept but must not be passed to other persons.

1.16 CONFIDENTIALITY AGREEMENT

Where required as a condition of the contract arrange for workers to provide a confidentially agreement. Workers who have not provided such an agreement shall be excluded from the site.

**Hold Points and Notification Points**

Refer to section 1232 INTERPRETATION & DEFINITIONS for definition of hold points and notification points.

**Working hours**

**WORKING HOURS RESTRICTIONS**

Comply with territorial authority consent conditions and noise and nuisance controls, in addition work on site is restricted to:

Weekdays:	Normal work hours
Saturdays:	9-5
Sundays:	9-5
Public holidays:	9-5

Work outside these hours may be permitted with the contract administrators consent. Allow a minimum of 24 hours notice (in writing) when seeking the contract administrators consent. If the contract administrator consent is given obtain any required permits and permission for such work

**Health and safety**

**HEALTH AND SAFETY LEGISLATION**

Refer to the requirements of the [Health and Safety at Work Act 2015](#). Comply also with all other relevant New Zealand safety legislation.

The Contractor will ensure, so far as is reasonably practicable, that, each subcontractor they engage and each separate contractor is aware of and complies with its obligations under health and safety-related law.

For the purpose of health and safety-related law, the contract administrator and others involved in contract administration and observation and construction monitoring will not at any time have management or control of the Workplace.

**HEALTH AND SAFETY REGULATIONS, CODES AND GUIDES**

Comply with:

- Relevant New Zealand safety legislation including, Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, also [Health and Safety in Employment Regulations 1995](#) as amended by that Regulation and the appropriate Health and Safety at Work Regulations.
- WorkSafe NZ publications including "Guidelines for the provision of facilities for general safety in the construction industry".
- Relevant codes of practice, guides, guidelines and standards.

Until further regulations are made under the [Health and Safety at Work Act 2015](#) to cover them, the transitional provisions of the Act continue in force until revoked or amended.

**HEALTH AND SAFETY IMPLEMENTATION**

Take all practical steps to make the site and the contract works safe and to provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

Co-operate, consult and co-ordinate health and safety matters with each PCBU including all subcontractors, suppliers, separate contractors, others engaged on the project and others who may be affected by the construction of the works.

Identify any significant hazards and risks.

Maintain proper procedures for dealing with any emergencies that may arise. Immediately investigate accidents, identify their cause and maintain a register of accidents and serious harm. Provide a copy of any report which the contractor is required to make to a public authority on any accident which is associated with carrying out the contract works and results in serious harm to any person.



Refer to individual work sections for detailed requirements on this project.

1.21 SUSPENSION OF HAZARDOUS WORK

On the request of the contract administrator, acting on reasonable grounds, suspend any identified hazardous activities and proceed to eliminate, isolate or minimise them in order to comply with the Act, without prejudice to any other rights of the principal under the contract.

1.22 SITE SAFETY PERSON

Appoint a suitably qualified site safety person to co-ordinate site safety and to attend all site meetings.

1.23 HEALTH AND SAFETY PLAN

Prepare and submit a health and safety plan to the contract administrator before commencing work on site. Include in that plan all people on site and the general public, as well as the following items and any other necessary items:

- identification of existing and potential construction hazards and risks
- Any design construction safety matters identified in section 1220 PROJECT and/or any separate project design construction safety report.
- safety procedures to eliminate, isolate or minimise construction hazards and risks
- the equipment to be used to minimise the hazards and risks
- the maintenance of a register of hazards and risks for the site
- the name and qualifications of the site safety person
- emergency procedures
- first aid facilities and safety equipment
- the methodology for notifying, recording and investigating accidents and injuries.

Advise the contract administrator of unusual or atypical features in the Plan in addition to any features already identified in section 1220 PROJECT and/or any separate project design construction safety report. Keep a copy of the plan in the site office.

1.24 MAINTAIN HEALTH AND SAFETY PLAN

Maintain health and safety plan and alter to accommodate changing situations and /or substitutions. Advise contract administrator of changes.

1.25 COMPLY WITH SITE SAFETY PLAN

Carry out all construction operations in accordance with the submitted health and safety plan.

1.26 INFORM WORKERS OF HAZARDS AND RISKS

Inform workers and others on the site of:

- hazards and risks they may be exposed to while working or other legitimate activities
- hazards and risks they may create while working which could harm others
- how these hazards and risks may be minimised
- emergency procedures
- the location of first aid facilities and safety equipment.

1.27 EXPLOSIVES

Do not use explosives except with the written approval of the territorial authority/WorkSafe NZ. Comply with their safety requirements and use construction blasters holding a current, appropriate Approved Handler Certificate and Controlled Substance Licence issued by WorkSafe NZ, to the Health and Safety at Work (Hazardous Substances) Regulations.

1.28 POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of WorkSafe NZ 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.

**SELECTIONS**

**Meetings**

2.1 SITE MEETINGS

Frequency: Only if required  
Time: TBC with admin  
Venue: onsite

Photographs

2.2 EXISTING STRUCTURES PHOTOGRAPHS

Copies required: Electronic, To keep for reference.

2.3 PROGRESS PHOTOGRAPHS

Position: Majority section on construction (For reference )

Frequency: After each stage of construction

Copies required: 1

## 1270 CONSTRUCTION

### 1 GENERAL

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

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

#### Quality control and assurance

##### 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.

##### NOTICE

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

##### 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

##### 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.

##### ACCEPTABLE NOISE LEVELS

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

### 1.6 PROVIDE INFORMATION TO NEIGHBOURS

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.

#### 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.

#### 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.

#### 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.

#### 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.

#### SMOKE FREE REQUIREMENTS

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

#### RESTRICTIONS

Do not:

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

#### Set-out and tolerances

##### 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.

##### DATUM

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

##### SET-OUT

Set out the work to conform with the drawings.

##### USE OF SET-OUT INSTRUMENTS

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

##### 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.

##### 1.18 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 <a href="#">NZS 3109</a> Concrete construction Clause 3.9 Tolerances for reinforcement Table 5.1 Tolerance for precast components Table 5.2 Tolerance for in situ construction To <a href="#">NZS 3114</a> Concrete surface finishes
Timber framing:	To <a href="#">NZS 3604</a> Timber-framed buildings Clause 2.2 Tolerances Table 2.1 Timber framing tolerances

Refer to work sections for tolerance requirements for finishes.

**Execution**

**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.

**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.

**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.

**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.

**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.

**MINIMISE DELAYS DUE TO WEATHER**

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

**Defective or damaged work**

**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**

**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.

**1.27 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.

1.28 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.

1.29 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**

1.30 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.

1.31 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.

1.32 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.

1.33 QUALIFICATIONS WORKERS – LICENSED UNDER STATUTE

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

1.34 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.

1.35 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.

1.36 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**

1.37 NEW PRODUCTS

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

1.38 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.

1.39 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.

1.40 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.

1.41 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.

1.42 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.

1.43 CONDITION OF PRODUCTS

To be in perfect condition when incorporated into the work.

1.44 INCOMPATIBLE PRODUCTS

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

**Samples**

1.45 SAMPLES FOR REVIEW

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

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

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

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

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

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

Refer to SAMPLES clauses in work sections for further detail.

1.46 CONTROL SAMPLES

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

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

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

1.47 OTHER SAMPLE REQUIREMENTS

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

**Prototypes**

1.48 PROTOTYPES - TESTING

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

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

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

1.49 PROTOTYPES - REVIEW

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

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

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

1.50 PROTOTYPES - GENERAL

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

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

**Spares & maintenance products**

1.51 SPARES & MAINTENANCE PRODUCTS

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

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



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

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

**Cleaning during the works**

1.52 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.

1.53 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**

1.54 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**

1.55 SPECIAL REQUIREMENTS

Refer to individual work sections for any special completion requirements.

1.56 LEAVE WORK

Leave work to the standard required for the following procedures.

1.57 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.

1.58 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.

1.59 COMPLETE ALL SERVICES

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

1.60 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 scrapers that may damage the glass.
- Remove adhesive residue left by labels and other temporary protection/markings.
- Clean out the interior of all cabinetry.
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract

works.

1.61 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 scrapers that may damage the glass.

**Commissioning**

1.62 SPECIAL REQUIREMENTS

Refer to individual work sections for any special commissioning requirements.

1.63 MOVING PARTS

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

1.64 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.

1.65 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.

1.66 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**

1.67 ADDITIONAL PRACTICAL COMPLETION INFORMATION

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

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

**Defects period submissions**

1.68 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**

#### **1.69 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.

## 2210 PREPARATION & GROUNDWORK

### 1 GENERAL

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

- footings and floor slabs

#### Documents

##### DOCUMENTS

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

[NZS 3604](#) Timber-framed buildings  
[WorkSafe NZ](#) [Good Practice Guidelines - Excavation Safety](#)

##### MANUFACTURER/SUPPLIER DOCUMENTS

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

##### SITE SAFETY

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

##### ARCHAEOLOGICAL DISCOVERY

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

### PRODUCTS

##### 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.

##### SAND FILL

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

##### HARD FILL

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

##### DRESSING COURSE

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

##### FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

### EXECUTION

##### EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the [WorkSafe NZ](#), [Good Practice Guidelines - Excavation Safety](#).

##### BURNING OF MATERIALS

Burning of materials is not permitted on site.

##### PROTECT EXISTING WORK

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

##### EROSION CONTROL

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

3.5 SURFACE PREPARATION

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

3.6 STOCKPILE TOPSOIL

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

3.7 GENERAL EXCAVATION

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

3.8 ROCK EXCAVATION

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

3.9 FOUNDATION EXCAVATION

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

3.10 INADEQUATE BEARING

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

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

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.

Confirm any changes with the territorial authority.

For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

3.11 STANDARD OF COMPACTION

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

3.12 GRANULAR BASE FOR SLABS

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

3.13 GENERAL BACKFILLING

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

3.14 SURPLUS MATERIAL

Remove surplus and excavated material from the site.



# 3155FR FIRTH RIBRAFT® FLOOR SYSTEMS

## 1 GENERAL

This section relates to the supply and installation of **Firth Industries RibRaft®** floor system and RibRaft® X-Pod® floor system.  
It includes:

- a nonspecific design reinforced concrete waffle raft floor slab-on-ground (RibRaft®) system.

1.1

### ABBREVIATIONS AND DEFINITIONS

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

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](http://www.steelcertification.com)

## Documents

1.2

### DOCUMENTS

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

[NZBC B1/VM1](#) Structure  
[NZBC B1/AS1](#) Structure  
[NZBC G13/AS1](#) Foul Water  
[NZS 3104](#) Specification for concrete production  
[NZS 3109](#) Concrete construction  
[NZS 3114](#) Specification for concrete surface finishes  
[NZS 3604](#) Timber-framed buildings  
[NZS 3631](#) NZ Timber grading rules  
[NZS 4229](#) Concrete masonry buildings not requiring specific engineering design  
[AS/NZS 4671](#) Steel reinforcing materials

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

1.3

### MANUFACTURER/SUPPLIER DOCUMENTS

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

Firth RibRaft® Floor System Manual \*\*  
Firth RibRaft® Technical Manual January 2020  
CodeMark™ Bureau Veritas [CM70056](#) - RibRaft® Floor System

\*\* A copy of this manual must be held on site.

Manufacturer/supplier contact details

Company: **Firth Industries**

Web: [www.firth.co.nz](http://www.firth.co.nz)

Email: [info@firth.co.nz](mailto:info@firth.co.nz)

Telephone: 0800 FIRTH1 (0800 347841)

Further information and/or names of tradespeople who have installed Firth RibRaft® floors are available by phoning Firth Information Service 0800 347841.

## Requirements

1.4

### NO SUBSTITUTIONS

Substitutions are not permitted to any specified Firth RibRaft® Floor System and Firth RibRaft® X-Pod® Floor System product or component, or associated Firth products.

Concrete used for the construction of Firth RibRaft® Floor System and Firth RibRaft® X-Pod® Floor Systems must be supplied by Firth, RibRaft® & RibRaft® X-Pod® formers are only available from Firth Industries and are only supplied on a project with confirmation of an order for Firth Concrete.

1.5 QUALIFICATIONS

Tradespeople to be competent, experienced, and familiar with the Firth RibRaft® Floor System and Firth RibRaft® X-Pod® Floor System materials and techniques specified.

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.

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.

Performance

COMPLIANCE - RIBRAFT® FLOOR SYSTEM

RibRaft® Floor System meets the requirements of the CodeMark® certificate CodeMark™ Bureau Veritas [CM70056](#) when used within the conditions and limitations of its Certificate of Conformity. Achieves compliance with NZBC as follows:

- [NZBC B1.3.1](#), 3.2, 3.3, B1.3.1, B1.3.3 (a,b,f,g,h,q,m), B1.3.4
- [NZBC B2.3.1](#) (a), B2.3.1(a), B2.3.2(a)
- [NZBC E2.3.3](#)
- [NZBC F2.3.1](#)
- [NZBC H1.3.1](#) (refer to limitation c)

PRODUCTS

Materials

BLINDING

50mm maximum compacted GAP 7.

TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to [NZS 3631](#).

DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to [NZS 3604](#): clause 7.5.4, Damp-proof membrane (DPM). Refer to SELECTIONS.

REINFORCEMENT

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

TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

Materials – RibRaft® Floor System

POLYSTYRENE PODS FORMERS– RIBRAFT® FLOOR SYSTEM

Firth RibRaft® proprietary purpose made polystyrene pods.

INTERNAL CORNER REINFORCEMENT – RIBRAFT® FLOOR SYSTEM

Minimum 2 x HD12 bars Grade 500E to [AS/NZS 4671](#).

MESH – RIBRAFT® FLOOR SYSTEM

Welded reinforcing mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1, generally, Class E, minimum to [NZBC B1/AS1](#) - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction). Minimum SE62 500E mesh or the equivalent.

2.9 CONCRETE 20Mpa – RIBRAFT® FLOOR SYSTEM

Firth Raftmix, a 20 MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size, supplied by Firth Industries.

Firth Raftmix™ for direct placement and Firth Raftmix™ Pump for pump applications

2.10 SPACERS

Firth proprietary spacers. Refer to SELECTIONS for size.

3 EXECUTION

SDC - Approved Building Consent Document - BC222012 - Pg 34 of 133 - 20/10/2022 - homann

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 the RibRaft® or RibRaft® Xpod system. Cut and/or fill sloping sites. Confirm finished floor level.

3.5 POST-CUT INSPECTION – RIBRAFT® FLOOR SYSTEM

Inspect and confirm that the soil conditions are as anticipated by the geotechnical investigation and report and conform to the requirements of the Firth RibRaft® manual. Refer to Firth RibRaft® Floor System Manual Section 1 - Design Information, 3.5 Foundation Soils.

3.6 TEMPORARY BUILDING PLATFORM DRAINAGE

Construct suitable drainage to keep excessive ground water off the building platform during and after construction as required.

3.7 HARDFILL

Place hardfill and ensure it is spread and compacted with mechanical compaction.

3.8 BLINDING LAYER

Spread GAP 7 blinding layer to a minimum 500mm past the outside edge of the slab, compact to a level layer no greater than 50mm thick and no higher than 305mm below finished floor level.

3.9 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.

3.10 INSTALL DAMP-PROOF MEMBRANE

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

Application - RibRaft® floor system

3.11 PIPED SERVICES – BELOW SLAB INSTALLATION

Ensure piped and cabled underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and according to Firth RibRaft® floor system requirements. Refer to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.4 Plumbing and Services.

3.12 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.

3.13 INSTALL SPACERS

Install spacers and locations to the Firth RibRaft® floor system requirements.

Form standard ribs between pods using Firth 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 Firth 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 loadbearing walls using Firth 300mm spacers. Place the spacers at a minimum of one spacer along the edge of each pod or part pod.

3.14 PLACE REINFORCING STEEL: RIB STEEL

Place rib reinforcing steel in the bottom of the internal ribs and supported in the correct position by the Firth spacers. Lap all steel 720mm minimum and hook all plain bars. At the junction with the edge beam, each rib steel bar shall sit on top of the edge beam bars and extend to the outermost bar. Allow for 75mm cover to the edge of the beam. Place 1 x HD12 bar in each 100mm wide rib and 2 x HD12 bars in each 300mm wide rib.

3.15 PLACE REINFORCING STEEL: EDGE BEAM STEEL

Place the two edge beam reinforcing bars in the bottom of the edge beam and supported in the correct position by the Firth spacers. Tie one edge beam bar below the mesh at the perimeter of the area covered by the polystyrene pods. Lap all steel 720mm minimum and hook all plain bars. At corners, the inner bottom bars and the top bars cross each other and extend to 75mm 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.

3.16 PLACE REINFORCING STEEL: 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 centers with 50mm side cover from the internal corner.

Install specified steel to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.9 Reinforcing Steel. Ensure specified minimum cover requirements are maintained.

3.17 PLACE REINFORCING MESH AND CHAIRS

Place reinforcing mesh over the pods and support on the mesh chairs spaced at 1200mm centers minimum, with two mesh chairs minimum placed per pod and with one mesh chair minimum per part pod.

3.18 MESH LAPS

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

- the spacing of the cross wires plus 50mm
- 225mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

**Application - General**

3.19 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings.

Form a minimum 50mm 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.

3.20 TOPPING SLAB DEPTH

Refer to SELECTIONS for required topping slab depth.

3.21 PRE-PLACEMENT INSPECTION

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

3.22 EQUIPOTENTIAL BONDING REINFORCING

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

3.23 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 Firth Raftmix™, Firth X-Pod® Raftmix™, Firth Raftmix™ Pump or Firth X-Pod® Raftmix Pump 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 Firth Raftmix™ or Firth X-Pod® Raftmix™ for placement in the floor directly from the concrete truck chute or Firth Raftmix™ Pump or Firth X-Pod® Raftmix™ Pump concrete for placement in the floor 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.

3.24 CONCRETE FINISHING

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

3.25 CONCRETE CURING

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

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

3.26 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints as shown on the plans after hardening to a depth of 25mm within 24 hours in summer or 48 hours in winter.

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

Bay dimensions formed by the shrinkage control joints to be limited to a maximum ratio of length to width of 2 to 1 with a maximum dimension of 6 meters. Place the shrinkage control joints over the 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide loadbearing rib, locate the cut directly above one edge of the 300mm rib.

3.27 CLEAN OUT SHRINKAGE CONTROL JOINTS

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

**Finishing**

3.28 STRIKE FORMWORK

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

3.29 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**

3.30 COMPLETION MATTERS

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

4 SELECTIONS

For further details on selections go to [www.firth.co.nz](http://www.firth.co.nz).  
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 DAMP-PROOF MEMBRANE

Location: As per plans  
Brand/type: 0.25mm minimum polyethylene DPM

Materials - RibRaft® Floor System

4.2 FIRTH RIBRAFT® POD FLOOR SYSTEM

Brand: Firth Ribraft® Floor System  
Size: 1100mm x 1100mm x 220mm  
Concrete mix: Firth Raftmix, 20MPa  
Topping thickness: 85mm  
Mesh: Class E, Grade 500E, minimum SE62 or equivalent

4.3 FIRTH SPACERS

Brand: Firth  
Size: 100mm and 300mm

3821 TIMBER FRAMING

1 GENERAL

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

ABBREVIATIONS AND DEFINITIONS

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

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

Documents

DOCUMENTS

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

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

BRANZ BU 582

Structurally fixed cavity battens

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

DIMENSIONS

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

PRODUCTS

Materials

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.

APPEARANCE TIMBERS

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

STRAPPING

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

Species:

Radiata pine

Grade:

LVL8

Size:

90mm x 45mm

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.

2.5 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Components

2.6

NAILS

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

2.7

SCREWS

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

2.8

BOLTS AND COACH SCREWS

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

2.9

THREADED RODS

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

2.10

TIMBER CONNECTORS AND FIXINGS

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

2.11

BRACING STRAPS

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

2.12

POWDER ACTUATED FASTENERS

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

2.13

CORROSION RISKS

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

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

EXECUTION

Conditions

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.

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).

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, up to 10 metres, 5mm
- Deviation from horizontal, over 10 metres, 10mm total
- Deviation from vertical position per 3 metres, 3mm
- Deviation from horizontal and vertical, within openings, 3mm.

### Application

#### SET-OUT

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

#### 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.

#### 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.

#### 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.

#### 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.

#### CUTTING

Cutting for straightening to comply with [NZS 3604](#), 8.5.3, **Straightening studs.**

#### 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.

#### POWDER-ACTUATED FASTENING TOOLS

Comply with the requirements of [WorkSafe NZ](#) 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.

#### 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.

#### 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 the manufacturer's requirements or to engineering specific design.

3.18 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. Make allowances for cladding control joints where required. Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc).

3.19 FIT BRACING

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

3.20 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.21 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section

Completion

3.22 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.

3.23 LEAVE

Leave work to the standard required by following procedures.

3.24 REMOVE

Remove debris, unused materials and elements from the site.

SELECTIONS

4.1 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata Pine	SG8	H1.2

4.2 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Trusses:	Radiata Pine	SG8	H1.2
Purlins:	Radiata Pine	SG8	H1.2
Valley boards:	Radiata Pine	Merch	H1.2

4.3 INTERIOR WALL FRAMING - RADIATA PINE

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

3827E ECOPLY® PLYWOOD BRACING SYSTEM

1 GENERAL

This section relates to the use of **Ecoply®** sheets for structural wall bracing:

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:  
FSC®  
COC Forest Stewardship Council®  
Chain of Custody

Documents

DOCUMENTS

Documents referred to in this section are:

- NZBC B1/AS1 Structure
- NZBC E2/AS1 External moisture
- AS/NZS 1170.2 Structural design actions - Wind actions
- NZS 1170.5 Structural design actions - Earthquake actions - New Zealand
- AS/NZS 1604.3 Specification for preservative treatment - Plywood
- AS/NZS 2269.0 Plywood - structural - specifications
- NZS 3602 Timber and wood-based products for use in building
- NZS 3603 Timber Structures Standard
- NZS 3604 Timber-framed buildings
- BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

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.

MANUFACTURER'S DOCUMENTS

CHH Woodproducts documents relating to work in this section are:

**Ecoply®** Specifications and Installation Guide  
**Ecoply®** Technical Notes.

FSC Certificates on request for W8.1 Plywood FSC Mix  
Carter Holt Harvey Tokoroa FSC-C012019 SCS-COC-001316 Controlled Wood SCS-CW-001316 (expires 5 Jun 2023)

Copies of the current product literature are available from Carter Holt Harvey Woodproducts Ltd

Web: [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)

Telephone: 0800 326 759

NO SUBSTITUTIONS

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

FSC CERTIFIED RESPONSIBLY SOURCED TIMBER

Abbreviations and definitions:  
FSC 100%

- FSC-certified material originating in FSC-certified forests or plantations that has not been mixed with material from another category throughout the supply chain. FSC 100% products can be used in FSC Mix product group.

FSC Mix % or FSC Mix Credit

- A mixture of the following - FSC 100%, FSC recycled timber, FSC Controlled Wood - and supplied with a percentage claim or Credit claim.

FSC Controlled Wood

- Forest of origin risk-assessed against FSC Controlled Wood standards and deemed low risk of being: illegally logged, violating traditional/civil/conservation rights, change of use or GM planting. All non-FSC certified timber plantations in NZ have been assessed and deemed low risk by FSC.

FSC Forest Management (FM) Certification

- A forest management unit independently FSC inspected and certified that it complies with the internationally-agreed FSC Principles.
- COC certification applies to those who process, transform or trade forest products, providing a guarantee about the production and source of FSC-certified products and tracking the production and distribution of the products.

Organisation website details  
Forest Stewardship Council website:- <https://nz.fsc.org/en-nz>

Performance

STRUCTURAL FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by AS/NZS 1170.2.

STRUCTURAL FIXINGS, EARTHQUAKE

Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604 and as required by NZS 1170.5.

BRACING SYSTEM

The Ecoply® bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading to NZBC B1 Structure, and to NZS 3603 Timber Structures Standard. Refer to table for summary of P21 Ratings for 2.4m high Ecoply® wall element:

Provide braced wall systems using GIB® Ezybrace Systems to meet the requirements of NZS 3604 when tested to BRANZ Technical Paper P21. Refer to drawings for location and type.

Brace No.	Minimum wall length	Lining Requirements	Bus/m Wind	Bus/m Earthquake
EP1	0.4m	7-12mm Ecoply® one side	80	95
EP1	0.6m	7-12mm Ecoply® one side	95	105
EP1	1.2m	7-12mm Ecoply® one side	120	135

Note:

- Plywood must be at least taken up to within 300mm of top plate.
- Hold down connections required each end of bracing element.
- Maximum 120 Bus/m for any bracing element on timber framed floor (NZS 3604)

PRODUCTS

Materials

FSC CERTIFIED TIMBER

Refer to SELECTIONS for details of amount, type, suppliers.  
Certified responsibly sourced FSC-COC Certified timber from forest to installation. Contractor to obtain timber supplier's FSC-COC certificate, delivery notes and/or invoices showing FSC-COC code and FSC Claim identified against product item(s). Also include signed FSC outsourcing agreements between parties (eg FSC timber broker and non-FSC door joiner) if applicable.

ECOPLY® STRUCTURAL PLYWOOD

Radiata pine veneer ply to AS/NZS 2269.0, DD face grade or better, 7mm minimum thick, H3.2 CCA treated to AS/NZS 1604.3.

Components

NAILS

Nail fixing for Ecoply® used as a structural bracing

Fixing type	Minimum nail length
Direct Fixed	50 x 2.8mm flat head hot dipped galvanized or stainless steel annular grooved nails

3 EXECUTION

Conditions

- 3.1
- HANDLE
- Handle sheets carefully and reject those with damaged faces or edges.
- 3.2
- STORE
- Store sheets in stacks clear of the ground, supported without sagging on evenly spaced horizontal bearers. Protect from damage and weather.
- 3.3
- WALL FRAMING
- Kiln dried timber framing sizes and set outs to [NZS 3604](#) with stud and nog centres and timber widths to **Ecoply®** Specification and Installation Guide. Treatment to [NZS 3602](#).

Application

BOTTOM PLATE FIXING

Use Gib HandiBrac® hold-down connections at each end of bracing element. Refer to the installation instructions supplied with connectors for correct bolt types to be used for either concrete or timber floors. Within the length the bracing element, bottom plates are fixed to the requirements of [NZS 3604](#).

SUPPORT EDGES AND JOINTS

Fully support edges and joints. Studs maximum 600mm centres and nogs maximum 800mm centres with the framing width of 45mm at each **Ecoply®** sheet joint.

NAIL FASTENERS TO BRACING ELEMENT

Place nail fasteners at 150mm centres around perimeter, 7mm from edge of the **Ecoply®** sheet and 300mm centres on intermediate supports of each **Ecoply®** sheet.

FIXING ECOPLY® STRUCTURAL PLYWOOD SHEETS

Fit and fix to [NZS 3604](#), [NZBC E2/AS1](#), 9.8 **Plywood sheet** and the manufacturer's bracing requirement with sheets and trim all in plumb, true alignment and face. Fix **Ecoply®** sheets vertically. Allow 2-3mm expansion gap between sheets. Cut edges of sheet to be placed to the top. For EPGs bracing system the **Ecoply®** may terminate within a maximum of 300mm below the top plate, e.g. at soffit line, where solid nogging must be provided for the full length of the bracing element to provide fixing of the **Ecoply®**.

FIXING GIB® PLASTERBOARD SHEETS

Fix Gib® plasterboard sheets to Gib® Ezybrace system. Refer to the appropriate Gib® Plasterboard section.

Completion

PROTECTION

Protect work from the weather until it is covered, coated or sealed.

REPLACE

Replace damaged or marked elements.

LEAVE

Leave work to the standard required by following procedures.

REMOVE

Remove all debris, unused materials and elements from the site.

SELECTIONS

4.1 FSC CERTIFIED TIMBER - SOURCING

The following timber from sourced to installed to be FSC COC Certified. Delivery notes and/or invoices must clearly show the FSC-COC Certificate Code of the company supplying the product, and the FSC Claim against the relevant product description: eg FSC 100%, FSC Mix, FSC Mix Credit or FSC Recycled.

ITEM



Manuf./supplier	Carter Holt Harvey Woodproducts Ltd
FSC COC Code:.	SCS-COC-001316 (expires 5 Jun 2023)
FSC Cert. No:	FSC-C012019 (expires 5 Jun 2023)
FSC Label:	FSC Mix
Species:	Pinus Radiata
Origin country:	New Zealand
4.2	ECOPLY® STRUCTURAL PLYWOOD
	Location: Refer to drawings and bracing calculations
	Manufacturer: CHH Woodproducts
	Brand/grade: Ecoply® DD or better A BOND
	Stress grade: F8
	Thickness: 7mm
	Treatment: H3.2 CCA
4.3	FASTENERS
	Type/size/material: ~Ecoply® used as a structural bracing, Direct Fixing, 50 x 2.8mm flat head hot dipped galvanized or stainless steel annular grooved nails
4.4	BRACING SYSTEMS
	Refer to Ecoply® Specification and Installation Guide for specific bracing details, and to Gib® Ezybrace system for bracing element fixing details. For location refer to drawn documentation and bracing calculations.

# 4161T THERMAKRAFT UNDERLAYS, FOILS & DPC

## 1 GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM, wall underlays, roofing underlays and accessories.

### 1.1 RELATED WORK

Refer to 3101

### 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:  
NZMRM New Zealand Metal Roofing Manufacturers Inc.

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

#### 1.3 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

[NZBC E2/AS1](#) External moisture

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

[NZS 4214](#) Methods of determining the total thermal resistance of parts of buildings

[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

#### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

[BRANZ Appraisal 329](#) - Supercourse 500™ Damp-Proof Course and Concealed Flashing

Manufacturer/supplier contact details

Company: Thermakraft Ltd

Web: [www.thermakraft.co.nz](http://www.thermakraft.co.nz)

Email: [info@thermakraft.co.nz](mailto:info@thermakraft.co.nz)

Telephone: 0800 806 595

### Warranties

#### 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Ltd warrant performance of products if design and installation complies with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of Thermakraft™ Product Warranty available on request.

### Requirements

1.6 NO SUBSTITUTIONS

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

1.7 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of Thermakraft™ products and familiar with Thermakraft™ technical literature and the related documents listed in this design i.e. [NZMRM CoP](#) NZ Metal Roof and Wall Cladding Code of Practice.

PRODUCTS

Materials

DPC

PERRIMETER DPC

Thermakraft Perrimeter DPC, a heavy kraft impregnated with high grade bitumen and coated with higher heat resistant bitumen to [AS/NZS 2904](#) and to the appropriate test methods set out in AS/NZS 4347.

DPM

DAMP-PROOF MEMBRANE - MEDIUM DUTY, BLACK

Thermathene Black™, a minimum of 250 microns polyethylene film. Complies with [NZS 3604](#), 7.5.4, Damp-proof Membrane, to [NZBC E2/AS1](#). Refer to SELECTIONS for type of jointing tape.

Wall underlays

BITUMINOUS SELF-SUPPORTING ROOFING & WALL UNDERLAY

Thermakraft 215™, bituminous self-supporting roofing underlay to [NZS 2295](#).

ALUBAND™ BITUMINOUS FLASHING TAPE

Thermakraft Aluband™ window flashing tape consists of synthetic faced reinforced bituminous window sealing tape, in widths of 75mm, 150mm and 200mm. Used to repair damaged bituminous underlays. Bitumen may react to sealants, always check compatibility. Thermakraft Corner Moulds must be used. Exposure 42 days. Install from 5°C. [BRANZ Appraisal 878](#), and is included in the Thermakraft One Wrap System™ [BRANZ Appraisal 962](#).

Roofing underlays

BITUMINOUS SELF-SUPPORTING ROOFING & WALL UNDERLAY

Thermakraft 215™, bituminous self-supporting roofing underlay to [NZS 2295](#).

Accessories

MULTI-FIT SEALS FOR UNDERLAY PENETRATIONS

Thermakraft™ Multi-Fit seals are a UV resistant EPDM material which forms a weathertight air seal for pipes and penetrations with a high strength acrylic adhesive suitable for use on all underlay systems. Available for use with pipes 15-110mm and cables 7-22mm both are pre-punched ensuring a tight accurate fit. No special tools required for installation.

GUTTER AND UNDER FLASHINGS

Thermakraft 215™, bituminous breather type underlay to [NZS 2295](#) cut to width for use under apron flashing.

Soffit liner cut to width from Thermakraft 215™ bituminous breather type underlay. Refer to SELECTIONS.

TAPE

Thermakraft™ tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:

- Thermakraft™ White General Purpose Underlay Tape
- Thermakraft™ Foil Tape 150
- Thermakraft™ Window Sealing Tapes, used to repair damaged bituminous underlays

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

Design application and installation of Thermakraft Building products to [NZBC E2/AS1](#), BRANZ Appraisals, Thermakraft Technical Literature and Industry Codes of Practice.

3.2 STORAGE

Store building 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 building construction phase will allow work of the required standard. Carry out remedial work identified before laying underlay.

Application DPC

3.4 DPC TO LOSP/CCA TREATED TIMBER

Lay Supercourse 500™ DPC under LOSP or CCA treated bottom plate of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

3.5 DPC TO MASONRY AND BRICK VENEER

Lay Supercourse 500™ DPC along based of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.

Application - DPM

3.6 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand blinding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type. Tape all joints and penetrations with Thermakraft™ White GP Tape 60mm.

Application - wall underlay

3.7 WALL UNDERLAY

Fix horizontally to outside face of framing in true alignment, with succeeding sheets overlapping 150mm to [NZBC E2/AS1](#), 9.1.7, Wall underlay, and refer to Thermakraft Industries for requirement for fastenings. Fix to Thermakraft Industries Technical Data specifications. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

Fix horizontally to outside face of framing in true alignment, with succeeding sheets overlapping 150mm to [NZBC E2/AS1](#), 9.1.7, Wall underlay, and refer to Thermakraft for requirement for fastenings. Fix to Thermakraft Technical Data specifications. Scribe neatly around penetrations and openings to leave no gaps. Flash all openings and tape all penetrations in accordance with Thermakraft Installation Guides. Keep clean, undamaged and without visible weather deterioration until closed in.

Application - roofing underlay

3.8 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixings. Lay underlay to avoid excessive dishing between purlins. When used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without support.

Horizontally lay 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 and avoid prolonged exposure by installing the roof immediately.

3.9 GUTTER AND UNDER FLASHINGS

Lay Thermakraft 215™ bituminous breather type underlay cut to width by manufacturer for use under apron flashing. Lap under flashings with adjoining underlays. Fix Thermakraft 215™ bituminous breather type underlay soffit liner from top plate down 150mm past ribbon plate.

Completion

3.10 CLEAN UP

Clean up as the work proceeds.

3.11 LEAVE

Leave work to the standard required by following procedures.

3.12 REMOVE

Remove debris, unused materials and elements from the site.

SELECTIONS

For further details on selections go to [www.thermakraft.co.nz](http://www.thermakraft.co.nz). Substitutions are not permitted to the following, unless stated otherwise.

Damp Proof Course

4.1 THERMAKRAFT - PERRIMETER DPC

Location: Timber Bottom Plates

Type: Thermakraft™ Perrimeter DPC

Damp Proof Membrane

4.2 THERMATHENE BLACK™

Location: Under Slab

Type: Thermathene Black™

Jointing tape: Thermakraft™ White General Purpose Underlay Tape

Wall underlays - bituminous

4.3 THERMAKRAFT 215™ BITUMINOUS WALL UNDERLAY

Location: External wall framing

Type: Thermakraft 215™ bituminous self-supporting underlay

Joining tape: Thermakraft White General Purpose Tape™

Flashing tape: Thermakraft Aluband™ flashing tape

Accessories: Thermakraft Oneseal™ penetration seal

Roofing Underlays

4.4 THERMAKRAFT BITUMINOUS ROOFING UNDERLAYS

Location: Roof Underlay

Type: Thermakraft 215™ bituminous self-supporting roofing underlay

Jointing tape: Thermakraft™ white GP tape 60mm

Window / Door Sealing System

4.5 THERMAKRAFT ALUBAND™ FLASHING TAPE

Location: Window & Door opening

Sill/head tape: 150mm Thermakraft Aluband™ (for 90mm framing)

Sill corners: Thermakraft Corner Mould™

Head corners: 75mm Thermakraft Aluband™ butterfly corners

Gutter and Under Flashing

4.6 GUTTER AND UNDER FLASHINGS

Location: Gutter & Apron Flashing



Type: Gutter flashing underlay 300mm wide, Apron flashing underlay  
415mm wide  
Jointing tape: Thermakraft™ window sill tape 75mm Aluband™ Xtreme<sup>1</sup>

4239JH JAMES HARDIE® SOFFITS

1 GENERAL

This section relates to the supply and fixing of James Hardie® products to the underside of exterior soffits, verges and eaves. It includes:

- James Hardie® Hardie™ Flex Eaves Lining

Documents

DOCUMENTS

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

- NZBC E2/AS1 External moisture
- AS/NZS 1170.2:2011 Structural design actions - Wind actions
- AS/NZS 2908.2 Cellulose-cement products - Flat sheet
- NZS 3602 Timber and wood-based products for use in building
- NZS 3604 Timber-framed buildings
- NASH Standard Part May 2019 Light Steel Framed Buildings

MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work: Eaves and Soffits Installation Manual by James Hardie® Fire and Acoustic Design Manual by James Hardie®

Manufacturer/supplier contact details  
Company: James Hardie New Zealand Limited  
Web: [www.jameshardie.co.nz](http://www.jameshardie.co.nz)  
Email: [info@jameshardie.co.nz](mailto:info@jameshardie.co.nz)  
Telephone: 0800 808 868

Warranties

WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

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

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

QUALIFICATIONS

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

NO SUBSTITUTIONS

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

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

1.8

PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

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

PRODUCTS

Materials

2.1

HARDIE™ FLEX EAVES LINING

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

Components

2.2

FASTENER TYPE

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

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

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

Components - Hardie™ Flex Eaves Lining

2.3

SOFFIT JOINTERS AND MOULDS

Extruded uPVC jointer, capping and scotia mould.

2.4

HARDIE™ FLEX NAILS

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

2.5

INSEAL TAPE

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

2.6

POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

Components - General

2.7

FLEXIBLE JOINT SEALANT

Refer to SELECTIONS.

EXECUTION

Conditions

3.1

STORAGE

Take delivery of products dry and undamaged. Store on site, lay flat on a smooth level surface clear of the ground. Protect materials, finished surfaces, edges and corners from damage, water and moisture.

3.2

HANDLING

Move/handle goods in accordance with James Hardie® requirements. Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject and replace goods that are damaged or will not provide the required finish. Install materials in a dry state.

3.3 SUBSTRATE - TIMBER FRAMING

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 sheets are fixed.

3.4 COMMENCE WORK

Do not commence work until the roof has been installed.

**Application - general**

3.5 SHEET LAYOUT

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

3.6 CUTTING SOFFIT CLADDING

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

3.7 CIRCULAR HOLE FORMING

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

3.8 IRREGULAR HOLE FORMING

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

3.9 INSTALL HARDIE™ FLEX EAVES LINING

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

3.10 BUTT JOINT

Paint sheet edges prior to installation.

3.11 CONTROL JOINT

Install control joint to James Hardie® installation manual requirements.

3.12 FASTENER - SIZE AND LAYOUT

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

3.13 SEALANTS

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

3.14 PAINTING

Refer to painting section/s for protective coating system.

**Completion**

3.15 COMPLETE

Ensure the work is complete with all components, accessories, trim, sealant and finishing properly installed so the soffit cladding system is completely weathertight.

3.16 REPLACE

Replace all damaged or marked elements.

3.17 CLEAN

Clean surfaces.

3.18 LEAVE

Leave work to the standard required for following procedures.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to [www.jameshardie.co.nz](http://www.jameshardie.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1

HARDIE™ FLEX EAVES LINING

Location: As per plans

Brand/type: James Hardie® Hardie™ Flex Eaves Lining

Thickness: 4.5mm

Painting

4.2

PAINTING

Refer to painting section/s for details.



## 4261 BRICK VENEER CLADDING

### 1 GENERAL

This section relates to clay brickwork as a veneer cladding.  
It includes:

- Standard brick veneer cladding

#### 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:

CB&PMA New Zealand Clay Brick & Paver Manufacturer's Association  
NZMTA New Zealand Masonry Trades Association  
BBFNZ Brick and Blocklayers Federation of New Zealand

#### Documents

##### DOCUMENTS

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

NZBC E2/AS1 External moisture  
NZBC B1/AS3 Structure  
NZS 1170.5 Structural design actions - Earthquake actions - New Zealand  
AS/NZS 2699.1 Built-in components for masonry construction - Wall ties  
AS/NZS 2699.3 Built-in components for masonry construction - Lintels and shelf angles (durability requirements)  
AS/NZS 2918:2001 Domestic solid fuel burning appliances - Installation  
NZS 3103 Sands for mortars and plasters  
NZS 3604 Timber-framed buildings  
NZS 4210 Masonry construction: materials and workmanship  
SNZ HB 4236 Masonry veneer wall cladding  
AS/NZS 4455.1 Masonry units, pavers, flags and segmental retaining wall units - Masonry units  
BRANZ Good practice guide: Masonry veneer  
CB&PMA TB1 Design Note TB1 Two Storey Clay Brick Veneer Construction - Made Easy  
ASTM D6134 [ASTM D6134 / D6134M-07\(2019\)e1](#), Standard Specification for Vulcanized Rubber Sheets Used in Waterproofing Systems

#### Requirements

##### QUALIFICATIONS

Bricklayers to be experienced, competent and familiar with the materials and the techniques specified.

All work to be installed or supervised by a Registered Master Mason or Licensed Building Practitioner (LBP): Licensed for Bricklaying and Blocklaying 1: Brick/masonry Veneer. RBW must be supervised by an LBP.

##### NO SUBSTITUTIONS

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

#### Compliance information

##### 1.5 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Producer Statement - Construction from the installer of proprietary brick veneer systems.
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.6 DESIGN PARAMETERS - NON SPECIFIC DESIGN - EARTHQUAKE

Design the installation to the seismic parameters of NZS 4210 Masonry construction: materials and workmanship.  
Refer to SELECTIONS for details.

1.7 COMPLIANCE - STANDARD BRICK VENEER SYSTEM

Brickwork to comply with SNZ HB 4236 Masonry veneer wall cladding.

PRODUCTS

Materials

CLAY BRICKS

To AS/NZS 4455.1.

VERMIN PROOFING

Either:

- Proprietary plastic weephole vents built into open perpend.
- Galvanized hexagon 10 mm mesh of 1 mm diameter steel wire 100 mm wide, complete with galvanized steel staples. Fix across base of cavity if gaps in veneer exceed 13 mm.

FLASHING - SILL

To NZBC E2/AS1 either:

- 2 ply asphaltic pliable waterproofing membrane to AS/NZS 2904.
- 1.5 mm butyl rubber to ASTM D6134.
- 0.5 mm pliable polyethylene to AS/NZS 2904.
- Proprietary self-adhesive flexible flashing tape to AS/NZS 2904.

FLASHING - JAMB

To NZBC E2/AS1 either:

- 2 ply asphaltic pliable waterproofing membrane to AS/NZS 2904.
- 0.5 mm pliable polyethylene to AS/NZS 2904.
- Proprietary self-adhesive flexible flashing tape to AS/NZS 2904.

DAMP-PROOF COURSE (DPC)

To NZBC E2/AS1 either:

- 2 coats bitumen-based paint to AS/NZS 2904.
- 1.0 mm min. bituminous sheet or heavy kraft strip laminate (saturated and coated with bitumen) to AS/NZS 2904.
- 1.0 mm min. butyl rubber to ASTM D6134.

DAMP-PROOF MEMBRANE (DPM)

0.25 mm min. polythene or polyethylene sheet to AS/NZS 2904.

Components - general

SILLS

Refer to SELECTIONS for type.

Components - standard brick veneer

LINTELS

Steel lintel angles over openings to AS/NZS 2699.3.

WALL TIES

To AS/NZS 2699.1. Metal ties screw fixed to framing.

REINFORCEMENT

Galvanized wire joint reinforcement. Refer to SELECTIONS for type.

**Accessories**

- 2.11 SAND FOR MORTAR  
To [NZS 3103](#). Chloride levels not to exceed 0.04% by dry weight of sand.
- 2.12 MORTAR  
Composed of Portland cement, sand and water with an admixture to the provisions of [NZS 4210](#): 2.2 Mortar. Obtain written approval of admixture being used. Obtain written approval if intending to use hydrated lime in the mortar.
- 2.13 ADMIXTURES  
To [NZS 4210](#).
- 2.14 WATER  
Clean, fresh and free from excess alkali, salt, silt and organic materials.

**EXECUTION**

**Conditions**

- 3.1 DELIVERY, STORAGE AND HANDLING  
To [NZS 4210](#) for aggregates, cement, bricks and reinforcement. Take delivery of materials and goods and store on site and protect from weather or damage. Protect finished surfaces, edges and corners from damage. Move/handle goods in accordance with manufacturer's requirements. Reject and replace goods that are damaged or will not provide the required finish.
- 3.2 PRE-INSTALLATION / APPLICATION REQUIREMENTS - CONCRETE BASE  
Check vertical and horizontal alignment. Any discrepancies exceeding the permitted tolerances shall be corrected before units are laid.

- 3.3 TIMBER FRAMING - STANDARD BRICK VENEER  
Check timber framing stud spacing is in accordance with [NZS 3604](#).

**PENETRATIONS**

- Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the brick veneer. Required preparatory work includes the following:
- brick veneer wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
  - brick veneer neatly finished off to all sides of openings
  - installation of flashings (those required to be installed prior to installation of penetrating elements).

**MEASURE MATERIALS**

Measure materials for mortar accurately by weight or volume using suitably calibrated equipment.

**WET WEATHER**

Keep bricks dry at all times prior to laying. Protect the top row of uncompleted brick walls. Protect freshly laid brickwork during interruption through rain and at completion of each day's work. Protect brickwork for a minimum of 6 hours.

**COLD WEATHER CONSTRUCTION**

When air temperature is below 5°C take the precautions required by [NZS 4210](#): 2.18 Cold weather construction.

**HOT WEATHER CONSTRUCTION**

When air temperature is above 25°C or there is a drying wind, or lower temperatures, take the precautions required by [NZS 4210](#): 2.19 Hot weather construction.

**KEEP FACE WORK CLEAN**

Keep clean during erection and until completion of the contract works. Turn back scaffold boards at night and during heavy rain. Do not rub face work to remove stains.

**Installation - general**

3.10 STANDARDS AND TOLERANCES

To [NZS 4210](#), table 2.2 Maximum tolerances.  
Refer to the general section CONSTRUCTION for general requirements.

3.11 COLOUR MIXING

Check all bricks delivered to site for colour variation, prior to commencing work. Ensure bricks are thoroughly blended from several pallets to ensure an even colour spread throughout the work.

3.12 UNIFORMITY

Carry up work with no portion more than 1500 mm above another at any time, raking back between levels.

3.13 BONDING

Lay bricks to the required bonding in the various locations. Refer to SELECTIONS/drawings.

3.14 PROVIDE WEEPHOLES

Provide weepholes at the bottom of cavities and cells to [SNZ HB 4236](#) and [NZBC E2/AS1, 9.2.6, Cavities](#), and as necessary to drain moisture to the outside air. Provide vent gap at the top of the veneer.

3.15 INSTALL VERMIN PROOFING

Either:

- Proprietary plastic weephole vents built into open perpend.
- Fold and staple one edge of the mesh to the substrate, with the mesh sloping down towards the veneer. Set the other edge into the mortar joint by half the thickness of the veneer or 50 mm, whichever is less.

3.16 CAVITY VENTILATION

Ventilate to outside air with top and bottom openings to the requirements of [SNZ HB 4236](#) and [NZBC E2/AS1, 9.2.6, Cavities](#). Seal cavity off from roof space.

3.17 CAVITY BRICKWORK BELOW GROUND

Fill all cavities below finished grade with concrete. Place a continuous damp-proof course within the first three mortar joints above ground. Seal the face of all brickwork below ground.

3.18 FORM OPENINGS

Unless detailed otherwise form openings to typical details from BRANZ Masonry veneer - Good practice guide.

3.19 SEPARATION JOINTS

Provide for wall movements of veneer with control joints to [NZS 4210: 2.10](#) Methods of controlling wall movements. Weatherproof as necessary.

3.20 FORM REVEALS

Form lintels, jambs and sills as detailed complete with flashings and all ready for following work.

3.21 JAMB FLASHINGS

Provide a flexible flashing to jambs of openings in cavity walls, fully lapped with horizontal damp-proof courses at head and sill, in accordance with [E2/AS1, 9.2.4, Flashings](#).

3.22 SILL FLASHINGS

Provide a flexible flashing under jointed sills, turned up at back and ends, in accordance with [E2/AS1, 9.2.4, Flashings](#).

3.23 REBATE DAMP PROOFING

Provide damp-proof course to stepped rebates supporting brick veneer in accordance with [E2/AS1, 9.2.5, Foundation support and damp-proofing](#).

**Installation - standard brick veneer**

3.24 INSTALL LINTELS

Fit lintel angles to openings, sized to [NZBC E2/AS1, 9.2.9, Openings in masonry veneer](#) Table 18E and placed to [NZBC E2/AS1, 9.2.9, Openings in masonry veneer](#).

3.25

CAVITY WIDTH

No cavity width less than 40 mm or more than 75 mm.

3.26

PLACE WALL TIES

Place wall ties to: -

- [NZS 4210](#): 2.9.5 Tie anchorage, cover and fixing; and
- [NZS 4210](#): 2.9.6 Placing of ties
- [NZS 4210](#): 2.9.7 Tie classification and spacing
- [NZBC E2/AS1](#), 9.2.7, **Wall ties**, for requirements, spacing, embedment, placement and materials

At unsupported edges and at all openings through veneered walls or non-grouted cavity walls, wall ties to be provided:

At the top and bottom of the opening:

- Not more than 300 mm or 2 courses, whichever is the smaller

At the sides of the opening or at an unsupported edge:

- Not more than 300 mm
- Where the veneer wall continues above or is interrupted by a damp-proof course or waterproof membrane, wall ties shall be provided in each of the first two courses above the membrane.

**Installation - ancillary work**

3.27

BUILD IN FIXINGS

Build in necessary fixing bricks or blocks for trims.

3.28

BUILD IN ELEMENTS

Build in sills, copings, lintels, steps and other elements using mortar similar to that in adjacent walls.

3.29

BUILD IN DOORS AND WINDOWS

Build in door and window frames as the work proceeds and bed in mortar similar to that in adjacent work.

**Completion**

3.30

ROUTINE CLEANING

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

3.31

EFFLORESCENCE, WATER CLEANING

To remove deposits, brush with a stiff-bristle broom and take away brushings from the locality.

Remove remaining deposit with a damp sponge. Wash wall thoroughly with a plentiful supply of clean water. Repeat this process every 4 weeks from appearance through to the completion of the contract works.

3.32

DEFECTIVE OR DAMAGED WORK

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

3.33

PROTECTION

Provide the following temporary protection of the finished work:

**SELECTIONS**

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

**Performance - seismic**

4.1

DESIGN PARAMETERS - NON SPECIFIC DESIGN - EARTHQUAKE

Building seismic zone: ~ (refer to [NZS 4210](#))

**Materials - general**

4.2

VERMIN PROOFING



4.3	Location:	Refer to plans
	Brand / type:	proprietary plastic weephole vent
	Size:	10 mm mesh
	Finish:	316 stainless steel
FLASHING - SILL		
4.4	Location:	Refer to plans
	Brand / type:	self-adhesive flexible flashing tape
4.5	Location:	Refer to plans
	Brand / type:	self-adhesive flexible flashing tape
DAMP-PROOF COURSE (DPC)		
4.6	Location:	Refer to plans
	Brand / type:	2 coats (bitumen-based paint)
Materials - standard brick veneer		
CLAY BRICKS FOR STANDARD BRICK VENEER SYSTEM		
4.7	Brand:	TBC by Client
	Size:	230mm long x 70mm wide x 76mm high
	Laying pattern:	stretcher bond
	Pointing:	Raked

Components - general

4.8	SILLS	
	Brand / type:	standard brick
	Colour:	TBC by Client & Contractor

Components - standard brick veneer

4.9	WALL TIES	
	Brand / type:	TBC by Client & Contractor
	Material:	Stainless steel

4.9	REINFORCEMENT	
	Brand / type:	TBC by Client & Contractor
	Material:	Galvanized mild steel

4311 PROFILED METAL ROOFING

1 GENERAL

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

ABBREVIATIONS

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

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silyl

Documents

DOCUMENTS

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

NZBC E2/AS1	External Moisture
AS/NZS 1170.2:2011	Structural design actions - Wind actions
AS/NZS 1665	Welding of aluminium structures
AS/NZS 1734	Aluminium and aluminium alloys - flat sheet, coiled sheet and plate
AS/NZS 1554.6	Welding stainless steels for structural purposes
ISO/TS 15510	Stainless steels - Chemical composition
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ Metal Roof and Wall Cladding Code of Practice

Warranties

WARRANTY - INSTALLER/APPLICATOR

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

5 years:	from the date of completion of the roof
Form:	Roofing installers standard form

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

WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against materials failure.	
15 years	For failure of coating adhesion
15 years	For weatherproofing by material penetration
Form:	Roofing manufacturers standard form

Requirements

QUALIFICATIONS

Carry out work with experienced, competent installers familiar with the products being used and with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

Performance

1.6 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.

1.7 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including penetrations through the roof and junctions with walls and parapets.

FIXINGS, WIND

Design and use the fixings appropriate for the design loads of this site; refer to general section 1220 PROJECT for details of wind zone. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

Performance - Wind (design by contractor)

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.

PRODUCTS

WIRE NETTING AND SAFETY MESH

Refer to 4161T UNDERLAYS, FOIL AND DPC.

UNDERLAY AND REFLECTIVE FOIL

Refer to 4161T UNDERLAYS, FOIL AND DPC.

INSULATION

Refer to appropriate insulation section.

GALVANIZED STEEL, UNPAINTED

Formability G550 steel sheet coated to AS 1397.

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

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

Components

FLASHINGS GENERALLY

To E2/AS1, 4.0 Flashings.

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

FLASHINGS TO VERGE, RIDGE AND HIP

Supplied by the roofing manufacturer to match or to suit the roofing in the same material as the roof.

Fixings

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.

FIXING SCREWS

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

2.10 RIVETS

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

Accessories

- 2.11 SEALANT  
Neutral Curing silicone or MS polymer sealant as required by the roofing manufacturer and used as directed.
- 2.12 LAP SEALING TAPE  
Closed cell self adhesive nitrile tape.

3 EXECUTION

Conditions

3.1 INSPECTION

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

3.2 FRAMING TIMBER MOISTURE

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

3.3 STORAGE

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

3.4 HANDLING

Avoid distortion and contact with damaging substances, including cement. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage. Use soft, flat soled shoes when fixing and for all other work on the roof.

3.5 SEPARATION

Place isolators between dissimilar metals, also separate roofing from treated timber and cement based materials. Do not use unpainted lead sheet or copper in contact with or allow water run-off onto galvanized or Zincalume® materials.

Application

3.6 FIX INSULATION

Refer to Thermal Insulation sections.

3.7 SET-OUT

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

3.8 END LAPS

End laps are not permitted, except where specifically detailed.

3.9 MOVEMENT JOINTS

Fixing and jointing to conform with the roofing manufacturer's requirements for thermal movement. Over timber framing, transverse flashings (those running long continuous framing members) to have expansion joints at maximum 12 centres.

3.10 FIXING GENERALLY

Install and fix in accordance with the [NZMRM CoP](#) requirements, and to roofing manufacturer's recommendations. Paint colour matched fixings and accessories before installation.

3.11 MARKING AND CUTTING

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

3.12 FIX SHEETS

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

3.13 STOP ENDS AND DOWNTURNS

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

3.14 FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Where no detail is provided flash to **NZMRM CoP** recommendations and the roofing manufacturer's requirements. Cut accurately and fix using sealant and rivets to detail and to the roofing manufacturer's requirements to form a weatherproof cover. For highly visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.15 USE OF SEALANTS

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

3.16 FLASHING PENETRATIONS

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

3.17 INSTALL RIDGING

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

Completion

3.18 REPLACE

Replace damaged or marked elements.

3.19 LEAVE

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely watertight.

3.20 REMOVE

Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spoutings, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

SELECTIONS

Roofing

4.1 PROFILED METAL ROOFING GALVANIZED STEEL, UNPAINTED

Brand/profile: Selected Corrugate

BMT: 0.40mm

Zinc coating class: ZM 450

Accessories

4.2 FLASHING

Material/thickness: Galvanized steel: 0.55mm and 0.75mm



4521 ALUMINIUM WINDOWS AND DOORS

1 GENERAL

This section relates to the manufacture, supply, and installation of:

- aluminium windows
- aluminium doors and frames
- flashings

11 RELATED WORK

Refer to glazing sections for glass types

12 ABBREVIATIONS AND TERMS

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

Documents

13 DOCUMENTS

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

- |                    |   |
|--------------------|---|
| NZBC E2/AS1        | External moisture   |
| NZBC F4/AS1        | Safety from falling   |
| NZBC H1/VM1        | Energy efficiency   |
| NZBC H1/AS1        | Energy efficiency   |
| AS/NZS 1170.2:2011 | Structural design actions - Wind actions  |
| NZS 1170.5         | Structural design actions - Earthquake actions - New Zealand  |
| AS/NZS 1580.108.1  | Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods                               |
| AS/NZS 1734        | Aluminium and aluminium alloys - flat sheets, coiled sheet and plate  |
| AS/NZS 1866        | Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes   |
| NZS 3604           | Timber-framed buildings   |
| AS 3715            | Metal finishing - Thermoset powder coatings for architectural applications  |
| NZS 4211           | Specification for performance of windows  |
| NZS 4223.3         | Glazing in buildings - Human impact safety requirements   |
| AS/NZS 4680        | Hot-dip galvanized (zinc) coatings on fabricated ferrous articles   |
| 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.                    |
| BS 3900            | Methods of tests for paints, Part C5: Determination of film thickness   |
| BRANZ BU 636       | Protecting Glass From Damage  |

Window & Glass Association NZ ([WGANZ](#)) documents:

- |   |   |  |
|---|---|--|
| <a href="#">Window Installation Guide</a> | 7 | Guide to Window Installation as described in E2/AS1 Amendment                            |
| <a href="#">PQAS</a>                      |   | Powder Coating Quality Assurance System  |
| <a href="#">SFA 3503-03</a>               |   | 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)

**Warranties**

14 WARRANTY - MANUFACTURER / SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years: For fabrication

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

15 WARRANTY - INSTALLER / APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

**Requirements**

16 QUALIFICATIONS

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

17 COMPLIANCE

Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).

18 CERTIFICATION

Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of [NZS 4211](#).

**Performance**

19 PERFORMANCE - WINDOWS AND DOORS

To [NZS 4211](#), including:

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

110 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

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

**Performance - Wind (design by contractor)**

111 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of [NZS 3604](#), table 5.4.  
Refer to SELECTIONS for wind zone.

**Finishes**

112 CERTIFY COATINGS - POWDER COATING

Certify on request, compliance with this specification and support with control and sampling records.  
Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.

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

**2 PRODUCTS**

<b>Materials</b>	
2.1	WINDOWS Refer to SELECTIONS for type and finish.
2.2	DOORS Refer to SELECTIONS for type and finish.
2.3	ALUMINIUM EXTRUSIONS Alloy designation to comply with <a href="#">AS/NZS 1866</a> . Branded and extruded for anodising or powder coating.
2.4	ALUMINIUM SHEET AND STRIP Complying with <a href="#">AS/NZS 1734</a> of suitable thickness. Rolled for anodising or powder coating. Alloy designation: 5251 - H16 or 5005 - H16
2.5	GLASS Refer to the glazing section for glass types and installation.
2.6	REVEALS - TIMBER PAINTED Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.
2.7	FLASHINGS GENERALLY To <a href="#">NZBC E2/AS1</a> , 9.1.10 <b>Windows and Doors</b> . 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.
<b>Components - for direct fix systems</b>	
2.8	SILL PAN FLASHING To <a href="#">NZBC E2/AS1</a> , 9.1.10.5 Window and Door Sills. 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.
2.9	SUPPORT ANGLE <a href="#">WGANZ</a> 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.
<b>Components - for cavity systems</b>	
2.10	STANDARD CAVITY CLOSER A perforated device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with <a href="#">NZBC E2/AS1</a> to the spaces above the window or door.
2.11	SUPPORT BAR <a href="#">WGANZ</a> extruded aluminium support bar with built in drainage and ventilation to <a href="#">NZBC E2/AS1</a> , to provide continuous support to the window unit. Size to suit cladding type.
<b>Components</b>	
2.12	GLAZING GASKETS Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.
2.13	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.
2.14	SAFETY STAYS Stainless steel non releasable restrictors to limit window opening to <a href="#">NZBC F4/AS1</a> , Section 2.0, <b>Opening windows</b> .

Sealants

2.15 STRUCTURAL SEALANT

Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a ± 40% movement factor complying with US Federal Specification TT-S-001543A.

2.16 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](#).

FOAM TAPE

Foam tape to [NZBC E2/AS1](#), 9.1.10.7 **Closed cell foam tape**.

Finishes

POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER

Polyester powder organic coating in accordance with [WGANZ PQAS](#), AS 3715, and AAMA 2603

EXECUTION

Conditions - generally

DO NOT DELIVER

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

UNLOAD WINDOW JOINERY

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

AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

PREVENT DAMAGE

Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

PROTECTIVE COVERINGS

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

ADDITIONAL PROTECTION

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

Conditions - fixings and fastenings

SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m² complying with [AS/NZS 4680](#).

3.9 INSTALLATION FIXING



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

**Assembly**

**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.

**TIMBER / PVC REVEALS**

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

**HARDWARE GENERALLY**

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

**SAFETY STAYS**

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with [NZBC F4/AS1 4.0](#), Opening windows.

**Installation - windows and doors**

**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.

**CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS**

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

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to [NZBC E2/AS1:9.1.5](#) **Wall underlays to wall openings**.
- Full height 20mm jamb battens to [NZBC E2/AS1](#) figure 72A (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

**INSTALLATION**

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

**INSTALLATION DIRECT FIX**

Install to window manufacturers details and drawings including sill pans to window and door units.

**INSTALLATION CAVITY CONSTRUCTION**

Install to [WGANZ Window Installation Guide](#) details and drawings including [WGANZ](#) sill support bars.  
For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to [NZBC E2/AS1](#), figure 62(d).

**INSTALL FLASHINGS**

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

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

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



3.20 COMPLETE AIR SEAL

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

3.21 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

**Application - jointing and sealing**

3.22 SEAL FRAMES ON SITE

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

3.23 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.

3.24 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.

3.25 SEALANT FINISH

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

**Completion - cleaning**

3.26 REMOVE TRADE DEBRIS

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

3.27 TRADE CLEAN

Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

**Completion**

3.28 PROTECTIVE COVERINGS

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

3.29 SAFETY

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

3.30 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM

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

3.31 REMOVE

At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

3.32 REPLACE

Replace damaged, cracked or marked elements.

4 SELECTIONS

Performance

- 4.1 THERMAL PERFORMANCE
- R-value: R0.26 (as determined from NZBC H1/VM1 or H1/AS1)

Performance - Wind (design by contractor)

- 4.2 WIND - NON SPECIFIC DESIGN
- Building wind zone High (refer to NZS 3604, table 5.4)

Window and door system

- 4.3 ALUMINIUM WINDOWS
- Manufacturer: TBC
- Type / location: As per plans

- 4.4 ALUMINIUM DOORS
- Manufacturer: TBC
- Type / location: As per plans

- 4.5 TIMBER REVEALS
- Timber species: Radiata Pine
- Grade / Treatment: H3.1
- Thickness: 20mm
- Reveals: Grooved for wall linings
- Finish: Painted

- 4.6 FLASHINGS
- Material/type: Powdercoated aluminium
- Pattern: Formed to suit details provided

Finishes - Powder Coating

- 4.7 POWDER COATED ALUMINIUM - EXTRA-DURABLE POLYESTER
- Type: Polyester organic powder coating
- System integrity: Minimum 10-years film integrity
- Thickness: Average of 90 microns with a minimum of 50 microns
- Colour: TBC
- Finish: TBC

4610MR METRO PERFORMANCE GLASS - RESIDENTIAL GLAZING

1 GENERAL

This section relates to the supply and fixing of **Metro Performance Glass (Metro)** products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- mirrors and mirror frames

RELATED WORK

Refer to [4610MR Metro Performance Glass - Residential Glazing](#)

ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in Place
EVA	Ethylene Vinyl Acetate
IGU	Insulating Glass Unit
LSG	Laminated Safety Glass
TSG	Toughened Safety Glass
TLSG	Toughened Laminated Safety Glass
MFG	Metro Frameless Glass

Documents

DOCUMENTS

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

<a href="#">NZBC F4/AS1</a>	Safety from falling
<a href="#">NZBC F9/AS1</a>	Means of restricting access to residential pools
<a href="#">NZBC H1/AS1</a>	Energy Efficiency
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">AS/NZS 2208</a>	Safety glazing materials in buildings
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4211</a>	Specification for performance of windows
<a href="#">NZS 4218</a>	Thermal insulation - Housing and Small Buildings
<a href="#">NZS 4223.1</a>	Glazing in buildings - Glass selection and glazing
<a href="#">NZS 4223.1 Supp1</a>	Glazing in buildings - Supplement 1 to <a href="#">NZS 4223.1</a> :2008 and <a href="#">NZS 4223.4</a> :2008
<a href="#">NZS 4223.2</a>	Glazing in buildings - Insulating glass units
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">NZS 4223.4</a>	Glazing in buildings - Wind, dead, snow and live action
<a href="#">AS/NZS 4666</a>	Insulating glass units
<a href="#">BRANZ BU 636</a>	Protecting Glass From Damage

MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier documents relating to this part of the work:  
Metro GlassTech Catalogue & Reference and Guide - 6th edition

Manufacturer/supplier contact details

Company: **Metro Performance Glass**

Web: [www.metroglass.co.nz](http://www.metroglass.co.nz)

Email: [info@metroglass.co.nz](mailto:info@metroglass.co.nz)

Telephone: 0800 65 89 45

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

- 10 years: for GlassTech Insulating Glass Units (IGU)
- 10 years: for SafeLite Laminated Safety Glass (LSG)
- 10 years: for TempaFloat Toughened Safety Glass (TSG)
- 10 years: for TempaScreen, TempaClad and TempaPrint digital printed glass

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

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

Performance

ENERGY EFFICIENCY

Provide glazing to meet the energy requirements of [NZS 4218](#) and [NZBC H1/AS1](#) for housing small buildings.

Refer to SELECTIONS and schedules for location and type of glazing.

PRODUCTS

NO SUBSTITUTIONS

Substitutions are not permitted to any specified Metro Performance Glass, products or systems.

Materials

TINTED FLOAT GLASS

Body tinted float glass.

Components, general

JOINTING, PUTTY AND SEALING MATERIALS

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Components, aluminium and uPVC glazing

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.

SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

EXECUTION

Conditions

GENERAL REQUIREMENTS

To [NZS 4223.1](#), [NZS 4223.2](#), [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, and [NZS 4223.4](#). All external glazing to be wind and watertight on completion.

DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 636, and [AS/NZS 4666](#) for IGUs.

GLASS CONDITION

All glass and panes shall have undamaged edges and surfaces.

3.4	GLASS THICKNESS	If not specifically stated in the glazing schedule determine the minimum thickness of glass for each pane as required by <a href="#">NZS 4223.1</a> , <a href="#">NZS 4223.3</a> , <a href="#">NZS 4223.4</a> . Determine the final glass thickness based on whether wind loading or human impact considerations govern.
3.5	REBATE DIMENSIONS	Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to <a href="#">NZS 4223.1</a> , Section 4 Glazing.
3.6	<b>Conditions - human impact safety requirements</b>	
3.6	SAFETY GLAZING, GENERAL REQUIREMENTS	Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to <a href="#">NZS 4223.3</a> as modified by <a href="#">NZBC B1/AS1</a> , 7.3.1, for thickness and maximum areas of panel Safety Glass.
3.7	SAFETY GLAZING MATERIAL	Use only safety glazing materials defined in <a href="#">NZS 4223.3</a> , as modified by <a href="#">NZBC B1/AS1</a> , 7.3.1, that also comply with the relevant requirements of <a href="#">AS/NZS 2208</a> . Ensure material is permanently marked and if cut by the distributor or installer mark each piece to <a href="#">NZS 4223.3</a> , 2.8 Identification.
3.8	CONTAINMENT	Edge cover to comply with <a href="#">NZS 4223.1</a> , Section 4 Glazing, table 5. Otherwise to <a href="#">NZS 4223.3</a> , 2.3 Edge cover.
3.9	<b>Assembly</b>	
3.9	WORKING OF GLASS	All working of glass as required in <a href="#">NZS 4223.1</a> .
3.10	EDGE WORK AND BEVELLING	All edges shall be clean cut unless specified in SELECTIONS or as shown on drawings.
3.11	SURFACE TREATMENT	Refer to SELECTIONS/drawings for finish.
3.12	SURFACE CUTTING	Refer to SELECTIONS/drawings for finish.
3.13	<b>Application aluminium</b>	
3.13	INSTALL GLASS TO ALUMINIUM FRAMES	Install glass to <a href="#">NZS 4223.1</a> . <ul style="list-style-type: none"><li>• Bead glaze to Section 4 Glazing.</li><li>• Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.</li></ul>
3.14	INSTALL SAFETY GLASS	To <a href="#">NZS 4223.3</a> .
3.15	<b>Finishing</b>	
3.15	SAFETY	Indicate the presence of transparent glass for the construction period, with tape or signs compatible with the glass type.
3.16	<b>Completion</b>	
3.16	TRADE CLEAN	Remove safety indicators and trade clean at completion of the building as required by the contract documents.
3.17	REPLACE	



Replace damaged, cracked or marked glass that occurs during glazing.

3.18 LEAVE

Leave work to the standard required by following procedures.

3.19 REMOVE

Remove debris, unused materials and elements from the site.

**SELECTIONS**

For further details on selections go to [www.metroglass.co.nz](http://www.metroglass.co.nz). Substitutions are not permitted to the following, unless stated otherwise.

**Performance - wind**

4.1 WIND ZONE - NON-SPECIFIC DESIGN

Building wind zone: High as determined from [NZS 3604](#), [NZS 4223.4](#) or [NZS 4211](#).

**Glass by type**

4.2 METRO PERFORMANCE GLASS - TINTED FLOAT GLASS

Location: Window and Door Glazing

Brand/type: Metro Tinted Float

Tint: TBC with client

Thickness: 4 mm

4711P PINK® BATTS® & BIB INSULATION

1 GENERAL

This section relates to Tasman Insulation Pink® Batts® insulation materials installed, laid, hung or fitted as thermal insulation:  
It includes:

- Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)
- Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)

RELATED WORK

Refer to 4721P PINK® BATTS® SILENCER® ACOUSTIC INSULATION for acoustic insulation.

ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:  
BIB Building Insulation Blanket

Documents

DOCUMENTS

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

- NZBC C/AS1-AS2 Protection from fire
- NZBC H1/AS1 Energy efficiency, 2.0 Building thermal envelope
- 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 4218 Thermal insulation - Housing and small buildings
- NZS 4220 Code of practice for energy conservation in non-residential buildings
- NZS 4243.1 Energy efficiency - Large buildings - Building thermal envelope
- NZS 4246 Energy efficiency - Installing bulk thermal insulation in residential buildings
- AS/NZS 4534 Zinc and zinc/aluminium-alloy coatings on steel wire
- AS/NZS 60695.11.5 Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

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.

MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents related to this section are:

Tasman Insulation New Zealand: Product Data Sheets and installation Instructions

BRANZ Appraisal 238 - Pink® Batts® Insulation

BRANZ Appraisal 632 - Pink® Batts® SnugFloor® Underfloor Insulation

Manufacturer/supplier contact details

Company:

Tasman Insulation New Zealand

Web:

[www.pinkbatts.co.nz](http://www.pinkbatts.co.nz)

Telephone:

0800 746 522

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

Lifetime Warranty For Pink® Batts® insulation products

- Provide this Warranty on the Pink® Batts® Lifetime Warranty Certificate form.

- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS GENERAL

Refer to 1270 CONSTRUCTION for requirements relating to qualifications. Installers to be **PinkFit® - Preferred Pink® Batts® installers**. A list of approved installers can be obtained from the web, by telephone or from the local building supplies merchant.

Web: [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz)

Telephone: Freephone 0800 746 534

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Tasman Insulation **Pink® Batts®** insulation or associated products, components or accessories.

Performance - combustibility

1.8 FIRE PREVENTION

**Pink® Batts®** insulation materials are considered a non-combustible material to [NZS/AS 1530.1](#) and need not be separated from heat sources such as fire places, heating appliances, flues and chimneys to [NZBC C/AS1](#) to [C/AS2](#), except if used in conjunction with or attached to other heat sensitive materials.

PRODUCTS

Materials

2.1 PINK® BATTS® CEILING INSULATION

**Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)** is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R-values and thickness options.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaires the insulation must withstand a 30s Needle Flame test to [AS/NZS 60695.11.5](#). Pink® Batts® insulation meets this requirement.

2.2 PINK® BATTS® WALL INSULATION

**Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)** is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R-values and thickness options.

Components

2.3 FASTENERS

Insulation anchors complete with retaining washer.

2.4 WIRE NETTING

Refer to 4161 UNDERLAYS, FOIL AND DPC for wire netting used to support the insulation.

2.5 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape, stapled over framing to retain insulation in unlined wall, ceiling and underfloor locations.

For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to [NZBC E2/AS1 9.1.8.5 Wall framing behind cavities](#).

2.6 ADHESIVE TAPE

Pressure sensitive adhesive 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

HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.4

INSPECTION

Before starting installation of **Pink® Batts® Insulation** blankets and slabs, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall underlays and vapour barriers are in place.

Application

INSTALL INSULATION - GENERAL

Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#) and [NZS 4220](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Confirm with fireplace manufacturer for clearances; **Pink® Batts®** insulation need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.6

RECESSED LIGHT FITTINGS - RESIDENTIAL

Residential recessed light fittings to [AS/NZS 3000](#), 4.5.2.3.5;

- Existing fittings or retrofit situations, fittings maybe unmarked
- New fittings can only be labelled - CA 80, CA 90, CA 135, IC, IC-F & IC-4

Refer to clause INSULATION CLEARANCES GENERALLY for clearances.

3.7

INSULATION CLEARANCES GENERALLY

Insulation may need to have a gap to some mechanical and electrical services and equipment, including ducts and chimneys.

The gaps should be to the [NZS 4246](#) based tables below or to the equipment manufacturers requirements if they require larger gaps.

Smaller gaps to manufacturers requirements can be used for equipment specifically manufactured with heat shielding or similar (excludes light fittings).  
Installed gap not to be more than 50mm bigger than the required gap.

The following tables are subject to:

- The requirements of [NZS 4246](#).
- The insulation is exposed to the source of heat or equipment etc.
- Insulation, has passed the needle flame test to [AS/NZS 60695.11.5](#) and/or is non-combustible.
- Gaps to hot surfaces may have to be increased with non-compliant insulation and plastic/
- Loose fill insulation will require fixed barriers to [NZS 4246](#) to maintain gaps. (secure loose pieces).
- "Secure insulation" if required means, glue, mechanical fix, or provide fixed barriers at gap edge of insulation to hold in place. Rigid or semi rigid insulation may only need a firm friction fit equipment manufacturer.
- Gaps to hot surfaces may be able to be reduced with non-combustible insulation, check with polymeric type insulation (EPS, XPS, PIR, etc), check with insulation manufacturer.

LIGHT FITTINGS

Type of fitting	Minimum insulation clearance	Comments

Recessed, marked NON-IC, or unmarked	100mm (increase if over 100W)	NON-IC fittings and new or old unmarked & unknown fittings, and/or insulation. Secure insulation.
Recessed, CA 80, CA 90 or CA 135	Abut fittings	Do NOT cover the fittings
Recessed, IC, IC-F or IC-4	Abut & cover fittings	Ensure insulation complies
Recessed, marked Do-Not-Cover	Manufacturers clearances	Do not cover the fittings
Independent control gear	Place on top of insulation & 50mm from fitting	If not on top allow 50mm clearance to insulation, do not cover. Includes, transformers, ballasts & drivers etc.
Surface fittings not exposed to insulation	Nil	Where surface fittings are isolated from insulation by appropriate linings. Excludes high heat fittings.
Surface fittings & exposed insulation	200mm	This is exposed insulation to any part of the exposed fitting & bulb/tube (e.g. exposed light in an unlined basement). Secure insulation.

### CHECK FOILS

Ensure foils are dry, clean, bright, undamaged and free of debris before installing insulation.

### CHECK WALL AND ROOF UNDERLAYS

Ensure foils are dry, clean, bright, undamaged and free of debris before installing insulation.

### CHECK VAPOUR BARRIERS

Ensure vapour barriers form a homogeneous sheet vapour barrier before installing insulation.

### INSTALL PINK® BATTS® CEILING INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Ceiling Insulation** beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the **Pink® Batts®** insulation and roof underlay. Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

### INSTALL PINK® BATTS® WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to [NZS 4246](#) for installation guidelines and **Pink® Batts®** installation instructions for detailed information.

### 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.

## Completion

### 3.14 COMPLETION MATTERS

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

## 4 SELECTIONS

For further details on selections go to [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz).



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

Thermal insulation

- 4.1

PINK® BATTs® CLASSIC CEILING INSULATION

Location: Ceiling insulation

Brand: **Pink® Batts® Classic Ceiling**

R value: R3.6

Thickness: 180mm
- 4.2

PINK® BATTs® ULTRA® WALL INSULATION

Location: Wall Insulation

Brand: **Pink® Batts® Ultra® Wall**

R value: R2.6

Thickness: 90mm

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:

- bracing systems
- wet area systems

1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

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

- NZBC C/AS2 Protection from fire
- NZBC E2/AS1 External moisture
- AS 1397 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
- AS/NZS 2588 Gypsum plasterboard
- AS/NZS 2589 Gypsum linings - Application and finishing
- NZS 3604 Timber-framed buildings
- AS/NZS 4600:2005 Cold-formed steel structures
- ISO 5660.1 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
- ISO 5660.2 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
- BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
- NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

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

- GIB Aqualine® Wet Area Systems (March 2007)
- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (June 2011), with amendments (December 2014)
- GIB Rondo® Metal Ceiling Batten Systems

- BRANZ Appraisal 928 (2016) GIB Ezybrace® Systems 2016
- BRANZ Appraisal 427 (2007) GIB Aqualine® Wet Area Systems

GreenTag Certification

WWLCG001-001-A-2015 - GreenTag™ GreenRate /

Level B for:

- GIB® Standard (10mm & 13mm)
- GIB Braceline® (10mm & 13mm)

Copies of the above literature are available at:

Company:

Winstone Wallboards

Web:

[www.gib.co.nz](http://www.gib.co.nz)

Telephone:

0800 100 442

Requirements

NO SUBSTITUTIONS

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

INSTALLER WORK SKILLS AND QUALIFICATIONS

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

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

Performance

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.

PRODUCTS

Materials

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

Components

CEILING BATTENS

GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

SCREWS

GIB® Grabber® drywall type screws as follows:

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

Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard
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Refer to GIB® requirements for appropriate details.

2.4 TAPE ON TRIMS AND EDGES

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

2.5 METAL ANGLE TRIMS

- GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS

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

Accessories

2.7 ADHESIVE

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

2.8 JOINTING COMPOUND

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

2.9 JOINTING TAPE

- GIB® jointing tape.

2.10 GAP FILLER

- GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

EXECUTION

Conditions

3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

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

3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

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

3.3 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in [AS/NZS 2589](#).

3.4 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

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

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

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

3.5 SUBSTRATE

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

3.6 TIMBER FRAME MOISTURE CONTENT

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

3.7 PROTECTION

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

**Application**

3.8 INSTALL CEILING BATTENS

Install to GIB® Rondo® Ceiling Batten Systems requirements.

3.9 LINING WALLS AND CEILINGS GENERALLY

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

3.10 BOARD ORIENTATION

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

3.11 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.12 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems (2016)

3.13 FORM CONTROL JOINTS

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

3.14 INSTALL TAPE-ON TRIMS

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

**Finishing**

3.15 FINISHING GENERALLY

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

**Completion & Commissioning**

3.16 COMPLETION MATTERS

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

**SELECTIONS**

**Plasterboard**

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As per plans	GIB® Standard plasterboard	10mm	4



4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As per plans	GIB Aqualine® plasterboard	10mm	4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As per plans	GIB® Standard plasterboard	13mm	4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As per plans	GIB Aqualine® plasterboard	13mm	4

4.5 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems (2016)

For bracing element location refer to drawn documentation.

Accessories

4.6 GIB® RONDO® CEILING BATTENS

Brand/type: GIB® Rondo® Ceiling battens

6221 TILING SYSTEMS

1 GENERAL

This section relates to the supply and installation of interior and exterior floor and wall tiles.  
It includes:

- Underlays
- Screeds and levelling compounds
- Primers
- Waterproofing systems
- Tile adhesives
- Grouts and sealants
- Tiles
- All other required components and accessories necessary to complete installation

Documents

DOCUMENTS

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

- NZBC D1/AS1 Access routes
- NZBC E3/AS1 Internal moisture
- AS 3740 Waterproofing of wet areas within residential buildings
- 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 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
- BRANZ Good practice guide: Tiling

Warranties

WARRANTY - INSTALLER/APPLICATOR - FOR TILING SYSTEMS

Provide an installer/applicator warranty:

2 years:  
For installation of tiling systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

WARRANTY - INSTALLER/APPLICATOR - FOR WATERPROOFING SYSTEMS

Provide an installer/applicator warranty:

5 years:  
For installation of waterproofing systems

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

QUALIFICATIONS - TILING SYSTEMS

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

QUALIFICATIONS - WATERPROOFING SYSTEMS

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

1.6 NO SUBSTITUTIONS

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

1.7 DEFLECTION CRITERIA FOR SUSPENDED FLOORS

Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

1.8 ADHESIVES COMPATIBILITY

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

1.9 INTERNAL / EXTERNAL MOISTURE

Wet area membranes under tiled areas to AS 3740, [NZBC E2/AS1](#) (exterior), [NZBC E3/AS1](#) (interior) and to BRANZ Good Practice Guide: Tiling.

2 PRODUCTS

Materials

TILES

Refer to SELECTIONS for product selection.

Materials - waterproofing

LIQUID WATERPROOFING MEMBRANE

To AS 3740. Refer to SELECTIONS for details.

Materials - adhesive and grout

TILE ADHESIVE

To AS ISO 13007.1.

SAND AND CEMENT GROUT

1 part Portland cement to 2-3 parts fine, washed sand, mixed to a paste consistency with a minimum of clean, potable water.

PROPRIETARY GROUT

Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.

Components

MOVEMENT JOINT SEALANT

To BRANZ Good practice guide: Tiling, section 5.0.

- Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
- Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.

Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

EXECUTION

DELIVERY, STORAGE AND HANDLING

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

Protect finished surfaces, edges and corners from damage.

Move/handle goods in accordance with manufacturer's requirements.

Reject and replace goods that are damaged or will not provide the required finish

3.2 CHECK TILES

Check tiles 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. Reject tiles that are damaged.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

3.4 SETTING OUT

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

2.5 GENERALLY

Prepare surface and complete tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

**Conditions**

3.6 INSPECT BACKGROUND CONDITIONS

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

Inspect background and substrate materials for any conditions unsuitable for tiling over.

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.

Do not commence work until the affected area is rectified. Commencement of installation constitutes acceptance of site conditions.

3.7 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.8 MOISTURE CONTENT

Ensure concrete floors & concrete and/or concrete block walls are cured and dry. Ensure moisture content is such that shrinkage is complete and thermal movement has been accommodated.

If in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less.

3.9 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.

**Application - preparation**

3.10 PREPARE SUBSTRATES

Prepare backgrounds as described in AS 3958.1, Section 4 as modified by BRANZ Good practice guide: Tiling. All surfaces to be structurally sound, dry, clean and free from movement, dirt, dust, oil, grease, wax, curing compounds, release agents and any other loose or contaminating materials.

Ensure surfaces are flat and true to a tolerance of ± 4mm in 2 metres from the required plane.

Remove projections, unevenness and loose material to leave a clean dust and dirt free surface.

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. Refer to SELECTIONS.

**Application - movement joints**

3.12 FORM MOVEMENT AND EXPANSION JOINTS

Install movement joints to go right through the tile and bed to the background, maintaining any waterproofing. Ensure any slip layer backing (bond breaker) required, is installed.

- Joint width minimums:
- 4-6mm interior tiles on concrete (with low moisture content)
  - 6-8mm interior tiles on dry timber structure

- 8-10mm exterior tiles on concrete (with low moisture content)
- 10-12mm exterior tiles on dry timber structure
- To match grout width, if equal/larger than above
- Larger to suit joint infill requirements (preformed jointers)

In wall tiling provide joints at; internal vertical corners, as well as joints at, floors, columns/beams, nibs, hobs and similar. Provide joints around sanitary fixtures, around fixtures interrupting the tile surface, at junctions with joinery fixtures, including window and door frames and built in cupboards, and at changes in substrate or background. In large area wall tiling provide vertical joints at not more than 3.6 metres spacing along the length of a wall and horizontal joints at each storey rise in the height of a wall, and over all existing substrate expansion joints.

In large areas of floor tiling provide joints at not more than 4 metres spacing in both directions and 3.6 metres externally. Provide expansion joints, at the perimeter of tile floors, at changes of level or slope, around structural features, changes in substrate, around sanitary fixtures and other fixtures interrupting the tile surface, and over all existing substrate expansion joints.

### 3.13 MOVEMENT AND EXPANSION JOINTS, INSTALL COMPOUND/SEALANT FILL

Carefully clean out the joint, insert the backing rod if required 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.

### Application - waterproofing

#### 3.14 INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS

Install waterproofing membrane to manufacturers requirements and in accordance with AS3740 and BRANZ Good Practice Guide, Tiling 6.0 Wet area tiling and 7.0 Waterproofing interior wet areas. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide: Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install minimum areas of waterproof membrane as follows:

Unenclosed shower cubicle

- Up wall to 300mm above fixed shower rose or to ceiling for flexible rose, must be at least 1800mm above base.
- Along walls at least 1500mm from fixed shower rose and plus hose length for flexible rose.
- To the floor within 1500mm of fixed shower rose and plus hose length for flexible rose.

Splashback to a vanity

- Up wall from floor and behind the vanity, to 150mm above and beyond each side of vanity.
- To floor under the vanity to match wall waterproofing and at least 600mm from wall.

### Application –tile installation generally

#### 3.15 FITTING TILES

Setting out, cutting and fitting of tiles to be as described in AS 3958.1. 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 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.

#### 3.16 TILE FINISH AND JOINTS

Ensure finished surfaces are flat and true to a tolerance of  $\pm 4\text{mm}$  in 2 metres from the required plane. Clean surplus bedding material from joint spaces and tile surface. 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  $\pm 4\text{mm}$  in 2 metres from the detailed joint alignment.

#### 3.17 ADHESIVE APPLICATION

Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. 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. If required, mix adhesive to manufacturer's instructions.

Notched trowel method



- Adhesive application to be as described in AS 3958.1, clause 5.6.2(a). Notched trowel sizes shall be 4.5mm x 4.5mm (mosaics) 6mm x 6mm x 6mm, 10mm x 10mm x 10mm, 12mm x 12mm x 12mm. Use an appropriately notched trowel to achieve full coverage.

Buttering method

- Adhesive application to be as described in AS 3958.1, Clause 5.6.2(c).

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.

Application - grouting

318 APPLY GROUTING

Grout tiling to AS 3958.1, clause 5.7. Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to depth of cushion and flush with surface to cushion edge and square-edge tiles. Remove surplus grout with a damp sponge and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

319 APPLY PROPRIETARY GROUTING

Remove spacers. Prepare joints, mix and apply grout and finish off to the grout manufacturer's requirements, to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

Application - sealing

320 SEALING

Apply selected sealer to tiling in accordance with manufacturer's requirements.

Cleaning

321 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

322 ROUTINE CLEANING

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

323 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked tiles. Replace damaged or marked tiles where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting.

324 PROTECTION

Provide the following temporary protection of the finished work:

Provide protection to floor tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

SELECTIONS

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

Materials - Tiles

4.1 FLOOR TILES

Location:	As per plans
Supplier/Brand:	TBC by Client
Type:	TBC by Client
Tile size:	TBC by Client
Tile colour:	TBC by Client

Materials - preparation & underlays

- 4.2
- PRIMER / MOISTURE BARRIER
- Location: As per plans
- Substrate: Concrete
- Manufacturer: Ardex
- Type: Ardex WPM 265 Water Base Primer

Materials - waterproofing

- 4.3
- LIQUID WATERPROOFING MEMBRANE
- Location: As per plans
- Manufacturer: Ardex
- Brand/type: Ardex WPM 002

Materials - adhesive and grout

- 4.4
- WET AREA TILE ADHESIVE
- Location: As per plans
- Manufacturer: TBC by Client
- Type: TBC by Client
- 4.5
- PROPRIETARY GROUT
- Location: As per plans
- Manufacturer: TBC by Client and Tiler
- Type: TBC by Client and Tiler
- Colour: Refer to relevant tile selection for grout colour
- Grout width: Refer to relevant tile selection for grout joint width

Components -movement and expansion joints

Accessories

- 4.6
- TILE AND GROUT SEALER
- Location: As per plans
- Manufacturer: TBC by Client and Tiler
- Type: TBC by Client and Tiler

Spares & maintenance products

6511 CARPETING

1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck). It includes:

- carpet underlay
- woven sheet carpet

Documents

DOCUMENTS

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

- NZBC C/AS2 Protection from fire
- AS/NZS 2455.1 Textile floor coverings - Installation practice - General

MANUFACTURER/SUPPLIER DOCUMENTS

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

Warranties

WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:  
1 year: For materials

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

Refer to the general section 1237 WARRANTIES for additional requirements.

WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:  
1 year: For execution

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

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

QUALIFICATIONS

Carpet layers to be experienced, competent trades people familiar with the materials and the techniques specified, and with AS/NZS 2455.1.

MOISTURE CONTENT OF CONCRETE SLAB

Concrete slab is be cured and dried to a relative humidity of not exceeding 75% or until the moisture content does not exceed 5.5%, in accordance with AS/NZS 2455.1, refer to section 6192 FLOORING SUBSTRATE PREPARATION.

ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

1.8 NO SUBSTITUTIONS

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

2 PRODUCTS

**Materials**

2.1 UNDERLAY

To [AS/NZS 2455.1](#) Soft underlay and underlays manufacturer's requirements. Refer to SELECTIONS for product selection.

2.2 CARPET

To [AS/NZS 2455.1](#) Textile floor coverings. Refer to SELECTIONS for product selection.

**Components**

BINDER BARS

Anodised aluminium section with fluted face.

DIVIDER STRIPS

Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.

EDGE GRIPPER

To [AS/NZS 2270](#). Timber/plywood with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

**Accessories**

TAPE

To carpet manufacturer's requirements.

**EXECUTION**

**Conditions**

DELIVERY

Take delivery of materials and goods and store on site and protect from damage. Accept rolls of carpet and accessories undamaged and dry.

HANDLE AND STORE

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

INSPECTION

Before starting work inspect the substrate to ensure that it will allow work of the required standard, and that all fittings and fixtures around which the carpet is to be scribed are in place.

PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

TAPE

Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

LAYOUT

Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

3.7 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

3.8 FLOOR PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION. Prepare floor and check conditions required for laying to [AS/NZS 2455.1](#), section 2.

**Application - substrate preparation**

3.9 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust. Refer to 6192 FLOORING SUBSTRATE PREPARATION.

**Application - carpet laying**

3.10 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.11 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to [AS/NZS 2455.1](#), section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

3.12 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

**Completion**

3.13 ROUTINE CLEANING

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

3.14 DEFECTIVE OR DAMAGED WORK

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

3.15 PROTECTION

Provide the following temporary protection of the finished work:

3.16 SPECIAL PROTECTION

Self Adhesive carpet protective film: ~

**SELECTIONS**

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

4.1 UNDERLAY

Location	Brand	Type/thickness /weight
Floor	High density bonded polyurethane foam (PBF)	7mm

4.2 CARPET

Location	Brand/type/weight/code	Installation method
TBC	TBC	TBC

**Spares & maintenance products**



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
- 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 ISO 9001 Quality management systems - requirements
- SNZ TS 3404 Durability requirements for steel structures and components
- WorkSafe NZ Guidelines for the provision of facilities and general safety in the construction industry
- WorkSafe NZ Guidelines for the management of lead-based paint
- MPNZA Specification manual
- MPNZA Health and Safety Programme
- Health and Safety at Work Act 2015

Requirements

1.4 NO SUBSTITUTIONS

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

1.5 QUALIFICATIONS

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

1.6 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety at Work Act 2015 and WorkSafe NZ: 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 NZ: Guidelines for the management of lead-based paint for the required procedures and precautions when:

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

1.7 MATERIAL SAFETY DATA SHEET

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

MANUFACTURER'S INSPECTION

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

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.

PRODUCTS

Materials

PAINT TYPES

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

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.

THINNERS AND ADDITIVES

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

Accessories

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.

EXECUTION

Conditions

EXECUTION

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

COATED SURFACES

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

PRE-PRIMED SURFACES

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

BRUSH DOWN

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

COMPATIBILITY

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3.6	<p>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.</p> <p><b>TREATED SURFACES</b></p> <p>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.</p> <p><b>BACK PAINTING</b></p> <p>Co-ordinate with cladding and/or lining installer as to who will do the work and timing.</p> <p><b>Exterior</b></p> <p>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.</p> <p>Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.</p> <p><b>Interior</b></p> <p>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.</p> <p>Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.</p> <p><b>ANCILLARY SURFACES</b></p> <p>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 unfinished. In cases of doubt obtain instructions before proceeding.</p> <p><b>HARDWARE</b></p> <p>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.</p> <p><b>PROTECTION</b></p> <p>Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.</p> <p><b>Preparation - unpainted and pre-primed timber and wood based products</b></p> <p><b>MOISTURE CONTENT</b></p> <p>Ensure moisture content at the time of application is near to the equilibrium moisture content pertaining to the particular locality in which the timber is used, without any excessive moisture content gradient between core and surface.</p> <p><b>PREPARING DRESSED TIMBER</b></p> <p>Ensure dressed timber is smooth, free from raised or woolly grain, planing burrs or other machining defects. Slightly round or ease sharp edges to ensure they can be properly coated. Sand timber to bring up to a smooth finish along the direction of the grain. Sand timber back to new condition timber that has been weathered.</p> <p><b>PREPARING ROUGH SAWN TIMBER</b></p> <p>Thoroughly brush along the direction of the grain to remove dust and dirt.</p> <p><b>PREPARING PRE-PRIMED TIMBER</b></p> <p>Check pre-prime coat for damage, powdering, weathering or loss of adhesion. Where primer is sound, thoroughly brush along the direction of the grain to remove dust and dirt. If there is doubt, sand back and re-prime.</p> <p><b>TIMBER SPECIES</b></p> <p>Check that the preparation and paint system is suitable for the timber species.</p> <p><b>PREPARING DAMAGE AND DEFECTS</b></p>

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

3.17 FIXINGS

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

3.18 CLEANING

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

**Preparation - gypsum plaster**

3.19 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**

3.20 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.21 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.

3.22 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**

3.23 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.

3.24 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.

3.25 CONCEALED JOINERY SURFACES

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

3.26 CONCEALED METAL SURFACES

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

3.27 DOORS



- 3.28 Prime or seal and paint all six faces of doors before hanging.
- 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.
- 3.29 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**

**PAINTING GENERALLY**

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

**MIXING**

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

**ENVIRONMENT**

Paint exterior surfaces only in favourable weather conditions:

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

**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

**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.

**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.

**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.

**DEFECTIVE WORK**

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

**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

3.39 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.

3.40 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.

3.41 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.

3.42 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.

3.43 REPLACE HARDWARE

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

SELECTIONS

SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

# 7123 HOT & COLD WATER SYSTEM

## 1 GENERAL

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

### RELATED WORK

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

### Documents

#### DOCUMENTS

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

- NZBC B2/AS1 Durability
- NZBC C/AS1-AS2 Protection from fire
- NZBC G4/AS1 Ventilation
- NZBC G12/VM1 Water supplies
- NZBC G12/AS1 Water supplies
- NZBC H1/AS1 Energy Efficiency
- AS/NZS 2492 Cross Linked Polyethylene (PE-X) pipe for pressure applications
- AS/NZS 2537.2 Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings

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

### Warranties

#### 1.3 WARRANTY

Provide warranty for:

2 years:

For the supply and installation of the plumbing system and fixtures

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

Requirements

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.

PIPEWORK LAYOUTS

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INFORMATION FOR OPERATION AND MAINTENANCE

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

HOT WATER TEMPERATURES

To NZBC G12/AS1, 6.14

Storage water heaters to store water at not less than 60°C.

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:

- 55°C - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

Performance

TESTING - TO NZBC G12/AS1

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

- Test to a pressure of 1500 kpa for period not less than 15 minutes. Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

PRODUCTS

Materials

POLYETHYLENE PIPE

To AS/NZS 4130 Series 1 complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/AS1, table 1. Except for solid black PE, protect from sunlight.

CROSS LINKED POLYETHYLENE PIPE

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

2.3

WATER METER

To the requirements of the network utility operator.

2.4

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](#).

2.5

BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to [AS/NZS 2845.1](#) where it is possible for water or contaminants to backflow into the potable water supply. Refer to [NZBC G12/ AS1 3.4](#) Backflow protection, and table 2, Selection of Backflow Protection.

2.6

TEMPERING VALVE

Tempering valve to [NZS 4617](#) to [NZBC G12/AS1](#).

**Materials - Hot water heating appliances**

**Components**

2.7

PROTECTIVE TAPE

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

**EXECUTION**

3.1

EXECUTION GENERALLY

Generally carry out the whole of this work and tests to [NZBC G12/VM1](#) or [NZBC G12/AS1](#).

3.2

HANDLE AND STORE

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

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

3.3

CORE HOLES AND SLEEVES

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

3.4

CONCEAL

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

3.5

CORROSION

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

3.6

THERMAL MOVEMENT

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

3.7

PIPE SIZE

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

3.8

ELECTROLYTIC ACTION

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

3.9

EXCAVATE

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

**Application - Jointing**

3.10	JOINTING POLYETHYLENE PIPE	Seal ring compression joints and electrofusion to <a href="#">NZBC G12/AS1</a> .
<b>Application - Pipework installation</b>		
3.11	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 <a href="#">NZBC G12/AS1</a> .
3.12	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 <a href="#">NZBC G12/VM1</a> or <a href="#">NZBC G12/AS1</a> , 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.
3.13	HOT WATER PIPEWORK	Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to <a href="#">NZBC G12/VM1</a> or <a href="#">NZBC G12/AS1</a> , table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings.
3.14	EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES	Lag all pipes with rigid insulation to the manufacturer's requirements and <a href="#">NZBC G12/VM1</a> or <a href="#">NZBC G12/AS1</a> .
3.15	IN-LINE FILTER	Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.
3.16	PENETRATIONS	Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.
<b>Installation - valves</b>		
3.17	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.
3.18	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 <a href="#">NZ Backflow Testing Standard</a> .
<b>Completion</b>		
3.19	LABEL	Label all pipework with permanent adhesive markers at 3 metre minimum intervals.
3.20	CLEAN IN-LINE FILTER	Clean all in-line filters on completion of works.
3.21	REPLACE	Replace damaged or marked elements.
3.22	LEAVE	Leave work to the standard required by following procedures.



3.23 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 POLYETHYLENE WATER MAIN

Size: 25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 EXPOSED PIPES

Type: white polyethylene composite pipe  
Accessories: stainless steel hose braid fitted with stainless steel nuts  
Manufacturer: TBC  
Brand: TBC

Valves and accessories

4.3 FLOOR/ZONE ISOLATING VALVES

Location: TBC with Plumber  
Brand/type: TBC with Plumber

4.4 APPLIANCE ISOLATING VALVES - CONCEALED

Appliance: TBC with Plumber  
Brand/type: TBC with Plumber

4.5 APPLIANCE ISOLATING VALVES - EXPOSED

Appliance: Washing machine  
Brand/type: Refer to tapware selections

4.6 IN-LINE FILTER

Location: adjacent to the main isolating valve  
Brand/type: TBC with Plumber

7126RH RINNAI HOT WATER SYSTEMS

1 GENERAL

This section relates to the supply and installation of **Rinnai New Zealand Limited** hot water systems.

It includes:

- Rinnai continuous flow gas water heating units

RELATED WORK

Refer to the hot and cold water system section for pipe systems

Refer to 7212 GAS SYSTEM LPG CYLINDERS for cylinder gas supply

Documents

DOCUMENTS

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

- NZBC C/AS1-AS2 Protection from fire
- NZBC G12/AS1 Water supplies
- AS/NZS 1596 Storage and handling of LP Gas
- NZS 4305 Energy efficiency - domestic type hot water systems
- NZS 4602 Low pressure copper thermal storage electric water heaters
- NZS 4607 Installation of thermal storage electric water heaters: valve vented systems

AS/NZS 5601.1 Gas installations Part 1: General installations  
Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019).

Gas (Safety and Measurement) Regulations 2010  
Plumbers, Gasfitters and Drainlayers Act 2006

MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to work in this section are:  
Rinnai Operation and Installation Guides

Manufacturer/supplier contact details

Company: **Rinnai New Zealand Limited**

Web: [www.rinnai.co.nz](http://www.rinnai.co.nz)

Email: [info@rinnai.co.nz](mailto:info@rinnai.co.nz)

Telephone: 0800 RINNAI (0800 746 624)

Requirements

NO SUBSTITUTIONS

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

COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010 and the network utility operator's requirements. Give notices for inspections and carry out tests as required.

QUALIFICATIONS

Gasfitters to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a Certifying Gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

INFORMATION FOR OPERATION AND MAINTENANCE

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

HOT WATER TEMPERATURES

To [NZBC G12/AS1,6.14](#)

Storage water heaters to store water at not less than 60°C.

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:

- 55°C - for personal hygiene fixtures in all other buildings.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners' sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc.) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc.) - in all buildings.

This clause excludes boiling units.

### Performance

#### FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

Testing should be at the time of completion. Confirm this timing before carrying out any tests. Test and demonstrate the system according to manufacturer's specification.

#### 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.

#### 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.

#### APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

### PRODUCTS

#### Materials - hot water gas heating units

##### CONTINUOUS FLOW GAS HOT WATER HEATING UNIT

Rinnai INFINITY® continuous flow gas hot water heating unit with an integral gas burner. Water temperature electronically preset by digital controllers where selected. Refer to SELECTIONS for controller type.

#### Components

##### FLUES

Matching Rinnai Flue system.

##### SECURITY BRACKET

Rinnai INFINITY® security bracket.

##### RECESS BOX

Rinnai INFINITY® metal recess box for housing the external Rinnai INFINITY® unit, pipe work and power supply behind a hinged door.

3 EXECUTION

Installation - general

3.1 HANDLE AND STORE

Handle and store units, cylinders, 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 according to manufacturer's instructions.

3.2 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.

3.3 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.

3.4 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.

3.5 PIPE SIZE

Plumber to check and confirm adequate pipe size, incoming mains and meter on site as a part of the installation. Pipe sizing calculation to [NZBC G12/AS1](#), table 4.

Installation - general, hot water cylinders

3.6 HOT WATER CYLINDER INSTALLATION - GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to [NZBC G12/AS1](#), 6.11, Water heater installation. Valve-vented systems to [NZS 4607](#).

3.7 SEISMIC RESTRAINTS - GAS WATER HEATING APPLIANCES

Gas appliances to be restrained to manufacturer's requirements, [AS/NZS 5601.1](#) and [NZBC C/AS1-AS2](#), 7.2 Gas-burning Appliances.

3.8 INSTALL TEMPERING VALVE

Install one metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

Installation - gas hot water systems

3.9 INSTALL CONTINUOUS FLOW GAS HOT WATER HEATING UNIT

Install Rinnai INFINITY® continuous flow gas hot water heating unit complete with the necessary fittings to Rinnai requirements and to [NZBC G12/AS1](#), 6.11, Water heater installation. Install flue (if applicable) to Rinnai details and requirements and digital controllers in location specified. Install in Rinnai recess box with security bracket where specified. Refer to section 7221 GAS APPLIANCES for installation of gas appliances.

3.10 INSTALL GAS APPLIANCES

Fit and connect gas appliances complete with flues as required to the appliance manufacturer's requirements and [AS/NZS 5601.1](#). Also refer to section 7221 GAS APPLIANCES for installation.

Completion

3.11 REPLACE

Replace damaged or marked elements.

3.12 LEAVE

Leave work to the standard required by following procedures.

3.13 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to [www.rinnai.co.nz](http://www.rinnai.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

**Gas hot water systems**

4.1 RINNAI INFINITY® - EXTERNAL CONTINUOUS FLOW GAS HOT WATER HEATING UNIT

Location: As per plans  
Brand: Rinnai  
Model: Rinnai INFINITY® ~  
Gas type: LPG

**Components**

4.2 RINNAI FLUE  
Location: As per plans  
Brand: Rinnai  
System: TBC

4.3 RINNAI RECESS BOX  
Location: As per plans  
Brand: Rinnai  
Size: TBC  
Model / type: Metal recess box

4.4 RINNAI PIPE COVER  
Location: External as per plans  
Brand: Rinnai  
Model: Rinnai INFINITY® ~ TBC



7212 GAS SYSTEM LPG CYLINDERS

1 GENERAL

This section relates to Installation and maintenance of a 45kg LPG twin cylinder system and associated piping systems.

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:

WorkSafe: WorkSafe New Zealand.

HSNO: Hazardous Substances and New Organisms Act 1996.

LPGA LPG Association of New Zealand Inc.

The following definitions apply specifically to this section:

Condensate: The liquid that separates from the gas downstream of any regulator due to the reduction in temperature resulting from pressure reduction.

Condensate trap: (also known as a drip leg or tailpipe) a device installed in a gas line to trap the condensate liquid

Enclosure: A compartment, an enclosed area or a partitioned-off space primarily used for the installing of a gas cylinder meter, or gas pressure regulator.

LAB number: Number allocated by WorkSafe when a cylinder is approved.

POL fitting: (Prest-O-Lite) The common name given for a standard union with left hand thread, used for connection to a 45kg cylinder.

Pigtail: A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.

Twin cylinder installation: A cylinder installation where two cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

12 DOCUMENTS

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

NZBC G10/AS1 Piped services

NZBC G11/AS1 Gas as an energy source

AS 4176

Polyethylene/aluminium and cross linked polyethylene/aluminium macrocomposite pipe systems for pressure applications

The storage and handling of LPG.

Electrical installations (known as the Australian/New Zealand Wiring Rules)

Fittings for polyethylene pipes for pressure applications

Polyethylene (PE) pipes for pressure applications

Gas Installations - general installations

LPGA CoP No.2 Installation and maintenance of twin 45kg cylinder systems

Electricity (Safety) Regulations 2010 (Reprint as at 21 January 2019)

Gas (Safety and Measurement) Regulations 2010

Plumbers, Gasfitters and Drainlayers Act 2006.

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.

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years:

For the complete gas system

- Provide this warranty on the installer/appliator 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

14

COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010, and [AS/NZS 3000](#).

15

QUALIFICATIONS

Refer to 1270 CONSTRUCTION for requirements relating to qualifications. Work to be carried out by gasfitters experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

16

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.

17

AS BUILT DOCUMENTS

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

Provide the following as built documents and records:

1:100 scale as-built plan of the gas pipe runs, sizes componentry and fittings.

Provide as built information prior to practical completion.

18

DESIGN

Design the piping system to [AS/NZS 5601.1](#), with pipe sizes to give a minimum pressure at any appliance inlet, to [AS/NZS 5601.1](#), Table 5.1, of 2.75 kPa for LPG. Include pressure regulators if required.

19

LOCATION OF CYLINDERS

Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#). Ensure location allows good accessibility for cylinder replacement to [AS/NZS 5601.1](#). Coordinate with electrical installations to ensure clearances are maintained.

## Compliance information

110

INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer, importer, or distributor warranty
- Installer / applicator warranty
- Gasfitting Certificate of Compliance - from the installer

111

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.

112

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.

1.13 GAS APPLIANCE COMPLIANCE

Supplier to provide Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 PIPEWORK GENERAL

Pipework requirements to [AS/NZS 5601.1](#), particularly [AS/NZS 5601.1](#), Section 4, **Means of compliance - materials fittings and components**.

COPPER PIPE

Complete with fittings to [AS/NZS 5601.1](#). Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**.

MACROCOMPOSITE PIPE

Polyethylene/aluminium/cross linked polyethylene combination (PE/AL/PE, PE-X/AL/PE-X or PE-X/AL/PE) macrocomposite pipe systems for pressure applications to AS 4176. Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. Used for general pipework, can also be used in ground beneath a building.

POLYETHYLENE PIPE

Polyethylene pipes to [AS/NZS 4130](#) Series two, or [AS/NZS 4130](#) Series three. Fittings to [AS/NZS 4129](#). Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. For use in ground but not beneath a building.

ISOLATING VALVES

Manual shut-off valves to [AS/NZS 5601.1](#).

CYLINDERS

Full 45kg cylinders to be supplied by the LPG supply company.

Components

AUTOMATIC CHANGEOVER REGULATOR

To the requirements of [AS/NZS 5601.1](#).

Automatic changeover regulator including a gas pressure regulator and non-return valve on each pigtail connection. The valve must comply with the requirements of [HSNO](#) and WorkSafe.

Changeover valves may be comprised of a first and second stage regulator system in a single body, or as a combination of separate component items.

Changeover valves complete with all components necessary for the operation of the bottle gas system including: -

- Flexible Pigtails
- Regulators
- Condensate trap
- Over pressure shut off
- All required valves

Protect from weather.

Accessories

ANCHORS AND CHAINS

To the requirements of [LPGA COP No.2](#).

All cylinders larger than 25 litres capacity shall be securely held in place by galvanized chains and brackets. The brackets shall be fastened to a wall or similar robust anchorage. The cylinder(s) fastenings must be capable of withstanding a steady applied load equal to four times the weight of the filled cylinder(s).

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

Carry out the whole of this work to the requirements of [NZBC G10/AS1](#), [NZBC G11/AS1](#) and [AS/NZS 5601.1](#).

3.4 BURIED PIPES

Pipes to be bedded in a trench, backfilled, marker taped and separated from other services, to [AS/NZS 5601.1](#), 5.4 **Installation of consumer piping underground**.

**Application**

3.5 INSTALL PIPING

Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to [AS/NZS 5601.1](#). Confirm the type of pipe and its location. Label pipework to distinguish it from other services to [AS/NZS 5601.1](#), 5.1.12 **Identification of pipework**.

3.6 EQUIPOTENTIAL BONDING METALLIC GAS SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic gas supply pipes and connected metallic gas fixtures are equipotential bonded (or at least conductor cable attached).

3.7 PRESSURE TEST

Pressure test the system for leakage to [AS/NZS 5601.1](#) before pipework is concealed by linings.

3.8 LOCATION OF CYLINDERS

Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**.

**Installation of cylinders**

3.9 GENERAL

Cylinders shall be installed upright with the valve uppermost to ensure the inlet to the safety valve remains in the vapour space clear of the liquid content of the cylinder.

- Clearances around cylinders shall comply with CLEARANCES AROUND CYLINDER clause.
- Where two or more exchange cylinders are installed, a manual or automatic changeover valve shall be fitted immediately upstream of the regulator. This valve may be an integral part of an automatic changeover regulator.

3.10 SUPPORT

Cylinders shall not be supported by other cylinders.

Cylinders shall be installed on supporting bases that are firm, level, of non-combustible material, and with a finished surface that prevents ponding of water and at least 50mm above the surrounding surface. Soil is not considered an acceptable supporting base.

All cylinders to be securely held in place by galvanized chains and anchor brackets. The brackets shall be fastened to a wall or similar robust anchorage. Fixings shall be galvanised or stainless steel.

3.11 CYLINDER CONNECTION

Cylinders should be connected directly to the changeover valve assembly by flexible pigtails.

An excess flow valve, to prevent cylinder venting if hose fails, shall be fitted immediately upstream of the piping or hose assembly. This excess flow valve may be an integral part of the POL fitting.

Pigtails connecting cylinders to changeover valves or manifolds should not exceed 1 metre in length.



A non-return valve must be fitted in the supply between each cylinder and the changeover valve, or in a manifold system, between each cylinder and its manifold connection, to prevent flow across the changeover system to [AS/NZS 5601.1](#).

3.12 CYLINDERS IN AN ENCLOSURE OR RECESS  
To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**.

3.13 CYLINDERS UNDER BUILDINGS  
To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**.

3.14 CLEARANCES AROUND CYLINDER

Cylinders should be installed with clearances complying with the [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**, figure J3 **Minimum clearance to ignition sources**, and figure J4 **Minimum clearance to a drain or opening into a building**, and at least 1 metre from any readily ignitable material. Readily ignitable materials include paper, dry grass or oily substances.

3.15 CYLINDER SAFETY VALVE DISCHARGE

The discharge point of the cylinder safety valve shall be directed away from any other cylinder, piping, building, drain, approach path to cylinders and any opening into or under a building.

3.16 TEST POINTS  
A pressure test point should be installed immediately downstream of each second stage regulator. Such test point may be an integral part of the regulator.

**Completion**

3.17 ROUTINE CLEANING

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

3.18 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

3.19 PROTECTION

Provide the following temporary protection of the finished work:

**Commissioning**

3.20 FINAL INSPECTION AND TESTING

Check cylinders are working and ensure all connected appliances are operating correctly. Carry out final inspections and testing, pressure test the system for leakage to [AS/NZS 5601.1](#). Leave system shut off at the cylinders until practical completion.

3.21 HANDOVER

Provide a copy of the system operating and maintenance instructions.

**Completion**

3.22 COMPLETION MATTERS

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

**SELECTIONS**

**Materials**

4.1	LPG CYLINDER SYSTEM	As per plans
	Location:	TBC by Client
	LPG supplier:	2 x 45kg
	Cylinder Number/size:	



Changeover valve supply:  
Cylinder restraint:

LPG supplier  
Anchors and chain ~ LPG supplier

7411S STEEL & TUBE RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Steel & Tube** rainwater disposal systems including spouting and downpipes, in metal.

RELATED WORK

Refer to 4311S STEEL & TUBE PROFILED METAL ROOFING for metal roofing.

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

Documents

DOCUMENTS

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

[NZMRM CoP](#) NZ Metal Roof and Wall Cladding Code of Practice

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.

MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

**Steel & Tube's** literature, including:

Product Guide  
Product Technical Statements  
Design Solutions

NZ Steel Specifiers and Builders Guide  
NZ Steel Installers Guide

Copies of the above literature are available from:

Web: [www.steelandtube.co.nz](http://www.steelandtube.co.nz)

Email: [info@steelandtube.co.nz](mailto:info@steelandtube.co.nz)

Telephone: 0800 333 247

Requirements

NO SUBSTITUTIONS

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

QUALIFICATIONS

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

Performance

TEST

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

2 PRODUCTS

Materials

2.1 SPOUTING

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

2.2 DOWNPIPES

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

Components

2.3 SPOUTING BRACKETS

All exposed brackets to be colour matched before installation. Brackets to be hot-dipped galvanised or zincalume. No electroplated components are acceptable.

2.4 DROPPERS

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

2.5 SEALANT

Steel & Tube MS Polymer sealant.

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.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - steel

3.5 INSTALL STEEL SPOUTING

Establish minimum falls necessary (minimum 1:500, 2mm in 1 metre) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible the centres should be reduced to 600mm and snow strap fitted. Lap spouting joints a minimum of 40mm and seal with Steel & Tube MS polymer sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and seal and rivet around the joint. All installations to conform to NZMRM CoP recommendations, section 5, Roof Drainage.

3.6 INSTALL STEEL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the storm water gully or pipe inlet. All installations to conform to NZMRM CoP recommendations section 5, Roof Drainage.

Application - copper

Application - general

3.7 INSTALLATION GENERALLY

Install to **NZMRM CoP** recommendations where not otherwise specified.

3.8 INSTALL VALLEY GUTTERS

Attach valley gutters to valley boards by clips allowing for thermal movement to **NZMRM CoP**, clause 5.6, **Valley Gutters**. Separate valley gutter from valley boards with a layer of roofing underlay.

3.9 INSTALL SECRET GUTTERS

Install secret gutters to fall allowing for thermal movement **NZMRM CoP**, clause 5.5.7, **Secret Gutters**. Rivet and seal joints with MS Polymer sealant.

Completion

REPLACE

Replace damaged or marked elements.

LEAVE

Leave the whole of this work discharging completely and freely into the storm water system and free of all debris. Leave work to the standard required by following procedures.

REMOVE

Remove debris, unused materials and elements from the site.

SELECTIONS

For further details on selections go to [www.steelandtube.co.nz](http://www.steelandtube.co.nz). Substitutions are not permitted to the following, unless stated otherwise.

STEEL & TUBE SPOUTING

Profile:

Quad

Size:

100mm

Base material:

Coated steel grade G300 Zincalume

BMT:

0.55mm

Coating system:

Colorsteel Endura

Steel & Tube colour: TBC with client & Contractor

STEEL & TUBE DOWNPIPES

Profile:

80mm

Size:

Coated steel grade G300 Zincalume

BMT:

0.55mm

Coating system:

Colorsteel Endura

Steel & Tube colour: TBC

Stainless steel system

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, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

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

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

Documents referred to in this section are:

- NZBC G1/AS1 Personal hygiene
- NZBC G13/AS1 Foul water - Sanitary plumbing
- NZBC G13/AS3 Plumbing and drainage
- AS 2887 Plastic waste fittings
- AS/NZS 1254 PVC-U pipes for storm water 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 3500.2 Plumbing and drainage - Sanitary plumbing and drainage Plumbers, Gasfitters and Drainlayers Act 2006

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2 PRODUCTS

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.

EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.  
White polybutylene or PVC, including all associated fittings.

3 EXECUTION

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.

ELECTROLYTIC ACTION

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

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 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.

3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.5 TEST



Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS1](#) or [AS/NZS 3500.2](#), 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

3.6 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

Brand/type: TBC

4.2 EXPOSED PIPES AND TRAPS

Brand/type: TBC

7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

DOCUMENTS REFERRED TO

Documents referred to in this section are:

- NZBC B1/AS1 Structure
- NZBC E1/AS1 Surface water
- NZBC E1/VM1 Surface water
- NZBC G13/AS2 Foul Water
- NZBC G13/AS3 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
- NZS 3104 Specification for concrete production
- AS/NZS 3500.2 Plumbing and drainage - Sanitary plumbing and drainage
- NZS 3604 Timber-framed buildings
- 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 Plumbers, Gasfitters and Drainlayers Act 2006

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.

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.

PRODUCTS

CONCRETE

17.5 MPa prescribed mix to NZS 3104.

REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260. Underground PVC-U pipe to be Classified as follows:

Classification:

SN4 - SN6

SN8 - SN10

SN16

Use:

Domestic & light load areas

Commercial & Industrial medium load areas

Public roads & high load areas

2.4 GULLY TRAPS - NZBC G13/AS2

To NZBC G13/AS2: 3.3 Gully traps, complete with grating.

2.5 INSPECTION COVERS

Cast iron frame with screw-down cover.

TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1

- Bedding: Clean granular non-cohesive material with a maximum particle size of 20 mm.
- Bedding & surround: Clean granular non-cohesive material with a maximum particle size of 20 mm.
- Compacted selected fill: Any Fine grain soil or granular material which is free from topsoil and rubbish and has a maximum particle size of 20 mm.
- Ordinary fill: Excavated material.
- Concrete: 75 mm thick concrete pad.

EXECUTION

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.
- NZBC G13/AS2, 5.6, Proximity of Trench to Building, for foul water drains.

MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

DRAINAGE GENERALLY - NZBC G13/AS2 & NZBC E1/AS1

Carry out foul water drainage work to NZBC G13/AS1 and NZBC G1/AS1 and complete all tests to NZBC G13/AS1, 7.1 Test Methods.

Carry out stormwater drainage work to NZBC E1/AS1, and complete all tests to NZBC E1/VM1, 8.0 Drain Leakage Tests.

Lay uPVC pipe systems to relevant sections of AS/NZS 2032, AS/NZS 2566.1 and AS/NZS 2566.2.

Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and AS/NZS 2566.1.

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.

CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to NZBC G13/AS2, 3.3 Gully traps.

LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to onsite soakpit.

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.

TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS1 or AS/NZS 3500.2, 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Carry out stormwater drainage work to NZBC E1/AS1, and complete all tests to NZBC E1/VM1, 8.0 Drain Leakage Tests.

PLACING & COMPACTING TRENCH BACKFILLING MATERIAL

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 using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg.

4 SELECTIONS

4.1 PVC-U PIPES

4.2 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1

7461 FOUL WATER DRAINAGE

1 GENERAL

This section relates to below ground, non-pressure foul water pipework complete with all maintenance access and fittings and connected to network utility operator sewers.

RELATED WORK

- Refer to 7431 DRAINAGE COMMON REQUIREMENTS for general matters
- Refer to 7421 SANITARY SYSTEMS for above ground pipework
- Refer to 7441 GROUNDWATER DRAINAGE for sub-soil drainage

Documents

DOCUMENTS

Documents referred to in this and the above sections are:

- NZBC G13/AS2 Foul water
- NZBC G13/AS3 Foul water
- 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/NZS 2566.1 Buried Flexible Pipelines - Structural Design
- AS/NZS 2566.2 Buried Flexible Pipelines - Installation
- NZS 3104 Specification for concrete production
- AS/NZS 3500.2 Plumbing and drainage - Sanitary plumbing and drainage
- AS/NZS 4058 Precast concrete pipe (pressure & non pressure)
- NZS 4229 Concrete masonry buildings not requiring specific engineering design
- AS/NZS 4671 Steel reinforcing materials
- AS/NZS 5065 Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work are to be supplied by drain layers and plumber to main contractor.

Performance

TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to NZBC G13/AS2,6.1 or AS/NZS 3500.2, 15 as required. Carry out and record a visualinspection that each joint showed no evidence of leaks.

PRODUCTS

Materials

REINFORCING STEEL

Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

PVC-U PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to AS/NZS 1260, buried pipes classified as follows:

Classification

SN4 - SN6

Domestic & light load areas

SN8 - SN10

Commercial & Industrial medium load areas

SN16

Public roads & high load areas

Use

2.3 GULLY TRAPS - NZBC G13/AS2

Gully traps complete with grating to NZBC G13/AS2, 3.3 Gully traps.



2.4 INSPECTION CHAMBERS - NZBC G13/AS2

Circular precast concrete or plastic to [NZBC G13/AS2](#), 5.7 **Access points**, complete with cast iron lid and frame. All joints watertight (base/pipes, base/riser, riser/riser, riser/lid, lid throat and throat/frame). Use epoxy mortar joints in concrete chambers. Use ring seals in plastic chambers.

**Accessories**

2.5 BEDDING, SURROUND AND FILLING MATERIALS

- Granular: Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
- Selected: Fine grain soil or granular material suitable for bedding and excluding topsoil, organic matter and rubbish.
- Ordinary: Top soil or other excavated materials excluding organic matter and rubbish.

CONCRETE

To [NZS 3104](#).

Prescribed mix 17.5 MPa: For in situ bases, anchors and pipe surrounds.

Prescribed mix 14 MPa: For bedding only.

**EXECUTION**

**Application**

BEDDING - NZBC G13/AS2

Place to [NZBC G13/AS2](#), 5.0 **Installation**, figure 7, **Bedding and backfilling**, using compacted granular material to avoid differential settlement and to obtain longitudinal support of the pipe.

SURROUND AND BACKFILL - NZBC G13/AS2

Place to [NZBC G13/AS2](#), figure 7 **Bedding and backfilling**, using compacted granular material and compacted fill. Compact in layers not exceeding 100mm.

SETTING OUT

Use string line, boning rod or laser equipment methods. Use surveying and levelling equipment to accurately set out design invert levels.

LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid. Install PVC-U pipes to [AS/NZS 2032](#) or [AS/NZS 2566.1](#) and [AS/NZS 2566.2](#). Install polyethylene Pipes to [AS/NZS 2033](#). Cap ends of uncompleted runs each day to prevent entry of foreign matter. Test drains and backfill progressively to minimise site disruption. Concrete cap trenches to drains with less than 375mm cover.

LAYING FOUL WATER DRAINS

Lay the drainage system from soil stacks and gully traps, including access chambers, inspection chambers, bends, junction inspections, and vents (fresh air inlets). Discharge into the network utility operator foul water system to their requirements.

DIFFERENTIAL SETTLEMENT

Provide flexible jointing, bedding and surrounding of pipes at junctions with manholes, foundation walls and other points where differential settlement may occur.

**Application - fittings**

3.7 CONSTRUCT GULLY TRAPS - NZBC G13/AS2

Set in a minimum 75mm thick concrete with top surround 25mm above paving and 100mm above other surfaces, to [NZBC G13/AS2](#), 3.3 **Gully traps**.

3.8 CONSTRUCT INSPECTION CHAMBERS - NZBC G13/AS2

Construct as detailed on a poured concrete footing to [NZBC G13/AS2](#), 5.7 **Access points**. Provide all necessary haunching to channels.

Application - connections

- 3.9
- CONNECTION TO FOUL WATER - PUBLIC MAINS
- Locate, excavate and expose the existing drain, connect new pipework to existing drain to the requirements of the network utility operator.
- 3.10
- CONNECTION TO FOUL WATER - PUBLIC MAINS ACCESS CHAMBER
- Locate, excavate and break into the existing chamber, modify as necessary and connect new pipes to the requirements of the network utility operator.

SELECTIONS

- 4.1
- GULLY TRAPS
- Manufacturer: TBC
- Material: Upvc in case in concrete
- Type: TBC
- 4.2
- INSPECTION CHAMBERS - NZBC G13/AS2
- Diameter: 80mm
- Type: UPVC

7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

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:

- CFL compact fluorescent lamp  
ELV extra low voltage  
GLS general lighting service  
IP international (ingress) protection classification  
LCD liquid crystal display  
LED light emitting diode  
MCB miniature circuit breaker  
NUO Network Utility Operator  
PCB printed circuit board  
PIR passive infrared  
RCBO residual current-operated circuit breaker with over current protection  
RCCB residual current-operated circuit breakers  
RCD residual current device  
SIA security integration architecture  
TPS tough plastic sheathed  
TCF Telecommunications Carriers' Forum

Documents

DOCUMENTS

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

- NZBC E2/AS1 External moisture  
NZBC F6/AS1 Visibility in escape routes  
NZBC F7/AS1 Warning systems  
NZBC G4/AS1 Ventilation  
AS/NZS 1125 Conductors in insulated electric cables and flexible cord  
AS/NZS 1768 Lightning protection  
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 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)  
AS/NZS 3008.1.2 Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions  
AS/NZS 3100 Approval and test specification-general requirements for electrical equipment  
AS/NZS 3112 Approval and test specification - Plugs and socket-outlets  
AS/NZS 3113 Approval and test specification - Ceiling roses

AS/NZS 3190

Approval and test specification - Residual current devices (current-operated earth-leakage devices)

AS/NZS 3439.3

Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards

AS 3786

Smoke alarms

NZS 4514

Interconnected smoke alarms for houses

AS/NZS 5000.2

Electric cables - Polymeric insulated - for working voltages up to and including 450/750v

AS/NZS 60335.1

Household and similar electrical appliances - Safety - General requirements

AS/NZS

Luminaires - Particular requirements - Recessed luminaires

60598.2.2:2001

AS/NZS 61439.3

Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).

IEC 61643

Components for low voltage surge protection devices

[Electricity \(Safety\) Regulations 2010](#) (Reprint as at 4 April 2016)

[TCF Premises Wiring Code of Practice 2011](#)

13

MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are to be provided to the Main contractor

**Warranties**

14

WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year:

Warranty period

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

**Requirements**

15

COMPLY

Comply with the Electricity (Safety) Regulations 2010, [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and [TCF Premises Wiring Code of Practice](#) 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.

16

QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

17

QUALIFICATIONS - SECURITY SYSTEM

Installation by an installer licensed under the Private Investigators and Security Guards Act. Installation of all security equipment to comply with [AS/NZS 2201.1](#) Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance.

18

SAFETY OF INSTALLATION - DESIGN BY ELECTRICAL ENGINEER

Before installation work commences obtain from the electrical engineer a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulation 58.

19

SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

1.10

ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity

- check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

1.11 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

PRODUCTS

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.

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:

Lighting circuits:

Power circuits:

Domestic: 1.5mm² on 10 amp MCBs

Commercial: 1.5mm² on 16 amp MCBs

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

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).

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.

DISTRIBUTION BOARD

Flush surface mount boards manufactured to [AS/NZS 3439.3](#), or [AS/NZS 61439.3](#), and installed in accordance with [AS/NZS 3000](#). Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with [AS/NZS 3190](#). MCBs to 4.5kA or 6kA rated.

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.

SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.

2.8 SWITCHED SOCKET UNITS



10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to <a href="#">AS/NZS 3100</a> , <a href="#">AS/NZS 3112</a> and <a href="#">AS/NZS 3113</a> , single or multi gang as detailed.	
2.9	<p><b>SMOKE ALARMS</b></p> <p>Type 1 domestic smoke alarm to <a href="#">NZBC F7/AS1</a>. 1.2 <b>Descriptions of alarm systems</b>. Alarm to AS 3786. A wired 230 volt ionised smoke detector type.</p> <p><b>SURGE PROTECTION</b></p> <p>Protection for the homes 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.</p> <p><b>BATTEN HOLDERS</b></p> <p>Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.</p> <p><b>DOOR BELL SYSTEM</b></p> <p>Complete with transformer for mounting on distribution board.</p> <p><b>LIGHT FITTINGS</b></p> <p>Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI &gt;80, L70.</p> <p><b>RESIDENTIAL RECESSED LIGHT FITTINGS</b></p> <p>Residential recessed luminaires to <a href="#">AS/NZS 60598.2.2</a>, types IC-F, IC, CA-80 or CA-135 only.</p> <p><b>EXHAUST FANS</b></p> <p>Ceiling, wall or duct mounted exhaust fans for ventilation to <a href="#">NZBC G4/AS1</a>, and compliant with <a href="#">AS/NZS 60335.1</a>.</p> <p><b>HEATED TOWEL RAILS</b></p> <p>Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with <a href="#">AS/NZS 60335.1</a>, scratch resistant powdercoated or chrome finish.</p> <p><b>OUTDOOR SWITCHES &amp; SOCKETS</b></p> <p>Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.</p> <p><b>EXECUTION</b></p> <p><b>MAIN SUPPLY</b></p> <p>Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.</p> <p><b>METER BOX</b></p> <p>Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to <a href="#">NZBC E2/AS1</a> fig 69. Arrange for meter installation and connection.</p> <p><b>DISTRIBUTION BOARD</b></p> <p>Fit to <a href="#">AS/NZS 3000</a> and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.</p> <p><b>CIRCUIT PROTECTION</b></p> <p>Install MCBs at distribution board to AS/NZS3000 to protect each final sub circuit.</p> <p><b>EARTH BONDS</b></p> <p>Bond together and to earth all plumbing fittings not adequately isolated, to <a href="#">AS/NZS 3000</a>, the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.</p>

### 3.6 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

### 3.7 EARTH LEAKAGE PROTECTION

Install RCD protection to [AS/NZS 3000](#).

### 3.8 RCD - DOMESTIC INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to [AS/NZS 3000](#).

### 3.9 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.

Install fixed wired RCD protected outlets (SRCD) in the following areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

### 3.10 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

### 3.11 CABLING

Install wiring systems to [AS/NZS 3000](#). All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

### 3.12 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.

### 3.13 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 noggs. Fix switch panel wall boxes to solid blocking.

### 3.14 SWITCH AND SOCKET UNITS

Fit all single and double switch units, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000mm above finished floor

Socket Units: 150mm above work benches

400mm above finished floor

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.

### 3.15 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

### 3.16 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

### 3.17 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to [AS/NZS 3000](#).

3.18 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;

The clearance between insulation and recessed downlights;

- Leave 100mm gap to [AS/NZS 3000](#), figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F.
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

3.19 SMOKE ALARMS

Install Type 1 domestic smoke alarm system to [NZBC F7/AS1 3.0 Domestic smoke alarms, NZS 4514](#) and to the alarm manufacturer's requirements. Fit neatly and without damage to the surrounding finish.

3.20 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with [AS/NZS 3000](#) and [AS/NZS 1768](#). When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

3.21 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.22 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturers requirements and installed in accordance with [AS/NZS 3000](#)
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with [AS/NZS 3000](#) and [NZBC G4/AS1](#).

3.23 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with [AS/NZS 3000](#) and in accordance with the manufacturer's recommendations;

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturer's specifications using recommended fittings and sealants to maintain the products integrity. Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

3.24 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Completion

3.25 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

4 SELECTIONS

Materials

Outlets - fittings