

**MEMORANDUM FROM LICENSED BUILDING PRACTITIONER: CERTIFICATE OF DESIGN WORK**

**1. Where is the building?** *Complete this field*

Street address of building:	13 Pearl Grove, Ashhurst
Building consent number:	

**2. Who owns the building?** *Complete all fields, using N/A if a field is not applicable*

Owner name:	Dirk Badenhorst	Title: e.g. Mr, Mrs, Ms, Dr
Owner email address:	Trevor.low@gjgardner.co.nz	
Owner contact number:	06-357-8020	
Owner mailing address:	C/O PO Box 466 PN	

**3. What work have you carried out/supervised?** *Complete as appropriate*

I carried out/supervised the following design work that is restricted building work:							
	Design Work that is restricted building work <i>Tick as applicable or enter N/A</i>				Description of restricted building work	Carried out/supervised	Reference to plans/specifications
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Primary structure	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A			
Foundations/subfloor framing	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Concrete foundation	Supervised	A06
Walls	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Timber frames and lintels	Supervised	A09
Roof	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Timber Trusses	Supervised	A10
Columns/beams	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Verandah beams & Post	Supervised	A09
Bracing	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Gib Ezy Brace	Supervised	A08
Other	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	N/A			
External moisture management systems	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A		Supervised	
Damp proofing	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	DPM under slab	Supervised	A06
Roof cladding or roof cladding system	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	Corona Shake	Supervised	A10

Ventilation system (for example, subfloor or cavity)	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	20mm drained cavity & 70 series cavity	Supervised	A11		
Wall cladding or wall cladding system	<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	N/A	JH Linea WB + Brick Cavity	Supervised	A11		
Waterproofing	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	N/A					
Other	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	N/A					
Fire safety systems	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	N/A					
Emergency warning systems, evacuation and fire service operation systems, suppression, control systems, or other	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	N/A					
<p><i>Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.</i></p>									
Are waivers or modifications of the building code required?						<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	No
<p><i>If Yes, please provide details including relevant code clauses</i></p>									

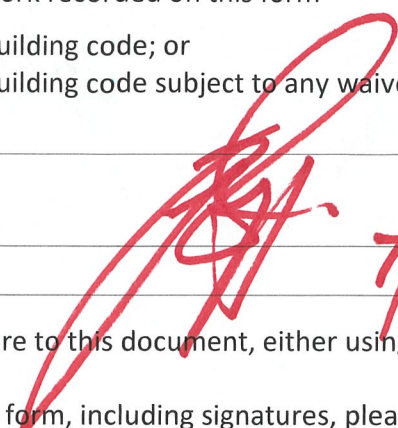
**4. What are your details?** Complete all fields, using N/A if a field is not applicable

Licensed Building Practitioner name:	Jeff Twigge	Licensed Building Practitioner number:	111561
Registered Architect number		Chartered Professional Engineer number:	
Mailing address:	43 Walding Street.		
Street address or registered office:	43 Walding Street.		
Contact number:	06-359-2844		
Email address:	Jonathan@plans.co.nz		

**5. Declaration**

I, Jeff Twigge (name of Licensed Building Practitioner) certify that the design work that is restricted building work recorded on this form—

- (a) complies with the building code; or
- (b) complies with the building code subject to any waiver or modification of the building code recorded on this form

Signature:	
Date:	7/3/2019

You can add a digital signature to this document, either using Adobe or your existing digital signature.

Once you have filled out the form, including signatures, please save the application to your computer. You can then submit the application with supporting documentation to your local council.

If you are unsure about what information to include in your application, a guidance document is available ([click here](#)).

Little Buildings Ltd t/a plans.co.nz



## SPECIFICATION

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

# Badenhorst Residence

## Project Specification

13 Pearl Grove, Ashhurst, New Zealand

Project Ref: GJ 19-01

Printed: 05 March 2019

**G.J. Gardner.** HOMES

**masterspec**

Specification built using Masterspec software  
Project ID: 171972 - 126157

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**masterspec**

Verified spec ID: **177725-126157**

This specification has been produced using Masterspec software and completed on 05/03/2019.

Scan to verify or go to [masterspec.co.nz/verify](https://masterspec.co.nz/verify)

# 1220 PROJECT

## 1 GENERAL

This general section describes the project including:

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

### 1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

#### **Description of the work**

### 1.2 SCOPE OF THE WORK

Construct a new 3 bedroom house on site with attached double garaging.

### 1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

#### **Site**

##### **Site environment - Wind**

### 1.4 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

Building wind zone High 44 M/S

##### **Site environment - Durability**

### 1.5 EXPOSURE ZONE

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

The site zone is: Zone B (Low Risk)

##### **Site environment - Seismic**

### 1.6 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to [NZS 3604](#), Section 5 Bracing design, 5.3 Earthquake bracing demand.

The earthquake zone Zone 3  
is:

##### **Archaeological discovery**

### 1.7 ANTIQUITIES AND ITEMS OF VALUE

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

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

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

# 1232 INTERPRETATION & DEFINITIONS

## 1 GENERAL

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

### Definitions

#### 1.1 DEFINITIONS

Required:	Required by the documents, the New Zealand Building Code or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Provide and fix:	"Provide" or "fix" or "supply" or "fix" if used separately mean provide and fix unless explicitly stated otherwise.
Review:	Review by the contract administrator is for general compliance only. Review does not remove the need for the contractor to comply with the stated requirements, details and specifications of the manufacturers and suppliers of individual components, materials and finishes. Neither can the review be construed as authorising departures from the contract documents.
Working day:	Working day means a calendar day other than any Saturday, Sunday, public holiday or any day falling within the period from 24 December to 5 January, both days inclusive, irrespective of the days on which work is actually carried out.
Workplace:	Workplace means the place where work is being carried out, or is customarily carried out, for a business or undertaking including any place where a worker goes, or is likely to be, while at work (under <a href="#">Health and Safety at Work Act 2015</a> ).

#### 1.2 PERSONNEL

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

### 1.3 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMA	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
AWCINZ	Association of Wall and Ceiling Industries of New Zealand Inc.
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
BS	British Standard
COP	Code of practice
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
LBP	Licensed Building Practitioner
MBIE	Ministry of Business, Innovation and Employment
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NZTA	New Zealand Transport Agency
NUO	Network Utility Operator
PCBU	Person Conducting a Business or Undertaking (under <a href="#">Health and Safety at Work Act 2015</a> )
OSH	Occupational Safety and Health
TA	Territorial Authority
TNZ	Transit New Zealand (Transit New Zealand is now New Zealand Transport Agency NZTA - some specifications are still prefixed TNZ)
RBW	Restricted Building Work
SARNZ	Scaffolding and Rigging New Zealand Inc
SED	Specific Engineering Design

### 1.4 DEFINED WORDS

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

### 1.5 WORDS IMPORTING PLURAL AND SINGULAR

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

# 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 F4/AS1</a>	Safety from falling
<a href="#">NZBC F5/AS1</a>	Construction and demolition hazards
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">AS/NZS 3012</a>	Electrical installations - Construction and demolition sites
<a href="#">NZS 1170.5</a>	Structural design actions - Earthquake actions - New Zealand
<a href="#">NZS 3109</a>	Concrete construction
<a href="#">NZS 3114</a>	Specification for concrete surface finishes
<a href="#">NZS 3404:1997</a>	Steel structures standard
<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 4210</a>	Masonry construction: Materials and workmanship
<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 in Employment Regulations 1995</a> (reprint 4 April 2016)	
<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>	
WorkSafe NZ	<a href="#">Guidelines for the provision of facilities and general safety in the construction industry</a>
WorkSafe NZ	<a href="#">Good Practice Guidelines - Excavation Safety</a>
WorkSafe NZ	<a href="#">Scaffolding in New Zealand - Good Practice Guidelines</a>
SARNZ	<a href="#">Best practice guideline for scaffolding in New Zealand</a>

# 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

### **Building Consent Authority documentation**

#### 1.1 BUILDING CONSENT

Obtain the building consent forms and documents from the owner and keep them on site. Liaise with the BCA 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.

#### 1.2 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.

#### 1.3 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**

#### 1.4 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 LPB previously advised.

Include the following as applicable

- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Bricklaying and block laying 1 Brick / masonry veneer
- Roofing 3 Metal tile roofer

Also provide names and contact details of the following

- Registered drainlayer
- Registered plumber
- Registered electrician

#### 1.5 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.

#### 1.6 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**

## 1.7 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 - Construction from the applicator / installer
- Producer Statement - 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.

## 1.8 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**

## 1.9 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

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

## 1.10 NO SUBSTITUTIONS

Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

## 1.11 PROPOSED SUBSTITUTIONS

A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the contractor where the contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

## 1.12 NOTIFICATION OF SUBSTITUTIONS

Notify 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

## 1.13 ACCEPTANCE OF SUBSTITUTIONS

The Contract administrator must advise of acceptance of substitutions in writing.

### **Variations to issued Building Consent**

## 1.14 CONTRACTOR VARIATION 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 variation.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

## 1.15 PRINCIPALS VARIATION 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**

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

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

## 1.17 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.

1.18 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**

1.19 BRANDED WORK SECTIONS

Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

1.20 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.

# 1237 WARRANTIES

## 1 GENERAL

### Warranties

#### 1.1 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.

- Commence warranties from the date of practical completion of the contract works (unless otherwise stated).
- Maintain their effectiveness for the times stated.
- Provide executed warranties prior to practical completion.

#### 1.2 WARRANTIES - INSTALLER/APPLICATOR

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

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

#### 1.3 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

#### 1.4 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.

#### 1.5 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.

#### 1.6 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)"

#### 1.7 WARRANTIES - SUBMISSION NZIA SCC CONTRACT

Refer to the contract conditions for any requirement relating to the time for submission for warranties and guarantees. Submit all warranties to the architect no later than the date of the contractor's advice of achieving practical completion.

## 1.8 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.

- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

# 1270 CONSTRUCTION

## 1 GENERAL

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

- Quality assurance
- Noise and nuisance
- Set out
- Common execution requirements
- Common materials requirements
- Supply of spare materials
- Common requirements for samples and tests
- Final presentation and cleaning
- Commissioning

### Quality control and assurance

#### 1.1 QUALITY ASSURANCE

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

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

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

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

### Noise and nuisance

#### 1.2 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 clause 11.

#### 1.3 ACCEPTABLE NOISE LEVELS

Refer to [NZS 6803](#) Tables 2 and [NZS 6803](#), tables 3 for the upper limits of construction work noise in residential and industrial areas over the various time periods, particularly 0730 to 1800 hours.

Note also the allowed adjustments and exemptions in [NZS 6803](#), 6. Do not exceed these limits.

#### 1.4 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](#), tables 2 and [NZS 6803](#), tables 3, cease the noise generating operation and remedy the problem.

#### 1.5 DIRT AND DROPPINGS

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

#### 1.6 DAMAGE AND NUISANCE

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

**Set-out and tolerances****1.7 SURVEY INFORMATION**

Locate and verify survey marks and datum points required to set out the works. Record and maintain their position. Re-establish and replace disturbed or obliterated marks.

**1.8 SET-OUT AND DATUM**

Set out the work to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

**1.9 SET-OUT BY LICENSED CADASTRAL SURVEYOR**

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

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

**1.10 CONFIRM HEIGHT IN RELATION TO BOUNDARY**

Provide a certificate prepared by a licensed cadastral surveyor that the building has been constructed within the allowed height in relation to boundary. Provide the certificate to the local authority. Provide a copy of the certificate to the contract administrator

**1.11 USE OF SET-OUT INSTRUMENTS**

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

**1.12 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.

**1.13 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****1.14 EXAMINE PREVIOUS WORK**

Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the contract administrator defects that may affect the quality of the proposed work and obtain instructions. Commencing work on any part means that previous work is accepted as being satisfactory for work of the required standard.

**1.15 WORKER QUALIFICATIONS**

All work to be level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

**1.16 MINIMISE DELAYS DUE TO WEATHER**

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

**Materials**

- 1.17 NEW PRODUCTS AND MATERIALS  
Materials and products to be new unless stated otherwise, of the specified standard, and complying with all cited documents.
- 1.18 COMPATIBILITY OF MATERIALS AND FINISHES  
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.
- 1.19 STORING PRODUCTS AND MATERIALS  
Take delivery of and store products, materials and components in accordance with codes of practice and the product manufacturer's or supplier's stated requirements. Maintain the proper condition of any protective packaging, wrappings or supports during delivery, unloading and storage.
- 1.20 HANDLING PRODUCTS AND MATERIALS  
Handle products, materials and components in accordance with codes of practice and the manufacturer's or supplier's stated guidelines. Avoid distortion and any contact with potentially damaging surfaces or conditions.
- 1.21 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.
- 1.22 INSTALLING PRODUCTS AND MATERIALS  
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.
- 1.23 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.
- 1.24 CONDITION OF MATERIALS AND COMPONENTS  
To be in perfect condition when incorporated into the work.
- 1.25 INCOMPATIBLE MATERIALS AND METALS  
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.
- Spares**
- 1.26 SPARES  
Collect, protect and store safely all spare materials required under the contract. Give the contract administrator an inventory of all spares.
- Final presentation and cleaning**
- 1.27 REMOVE TEMPORARY PROTECTION  
Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.
- 1.28 REPLACE DAMAGED MATERIALS  
Replace all materials or component damaged during the works to the standard of and integral with the original.
- 1.29 COMPLETE ALL SERVICES  
Ensure all services are complete and operational, with all temporary labelling removed, required labelling fixed and service instructions provided.

### 1.30 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.
- Remove adhesive residue left by labels and other temporary protection/markings
- Clean out the interior of all cabinetry
- Wash down external concrete including driveways and concrete masonry. Take care when waterblasting to not cause damage to the surface or allow water to enter the building.
- Remove rubbish and building material from the area immediately adjacent to the contract works

#### **Commissioning**

### 1.31 MOVING PARTS

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

### 1.32 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.

# 3101 CONCRETE WORK - BASIC

## 1 GENERAL

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

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

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

ACRS web site - [www.steelcertification.com](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:

<a href="#">NZBC B1/AS1</a>	Structure
<a href="#">NZBC B1/VM1</a>	Structure
<a href="#">NZBC E2/AS3</a>	External moisture
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
<a href="#">NZS 3101.1</a>	Concrete structures standard
<a href="#">NZS 3104</a>	Specification for concrete production
<a href="#">NZS 3109</a>	Concrete construction
<a href="#">NZS 3114</a>	Specification for concrete surface finishes
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4229</a>	Concrete masonry buildings not requiring specific engineering design
<a href="#">AS/NZS 4671</a>	Steel reinforcing materials
<a href="#">AS/NZS 4858</a>	Wet area membranes
<a href="#">CCANZ CP 01</a>	Code of practice for weathertight concrete and concrete masonry construction

### Requirements

### 1.3 QUALIFICATIONS

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

### 1.4 STEEL REINFORCING COMPLIANCE

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

## 2 PRODUCTS

### 2.1 NORMAL CONCRETE

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

### 2.2 REINFORCEMENT

Bars to [AS/NZS 4671](#). Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to [AS/NZS 4671](#), and 500E mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1.

- 2.3 MESH FOR SLABS TO NZS 3604 OR NZS 4229  
For slabs on ground mesh to be welded reinforcing mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1, Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m<sup>2</sup> (1.14kg/m<sup>2</sup> in each direction).
- 2.4 TYING WIRE  
Mild drawn steel wire not less than 1.2mm diameter.
- 2.5 SPACERS AND CHAIRS  
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.
- 2.6 DAMP-PROOF MEMBRANE  
0.25mm minimum polyethylene to [NZS 3604](#), 7.5.4, Damp-proof membrane.
- ### 3 EXECUTION
- 3.1 HANDLE AND STORE  
Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.  
  
Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.
- 3.2 INSTALL DAMP-PROOF MEMBRANE  
Apply polythene membrane to prepared basecourse with 150mm laps between sheets. Tape seal laps and penetrations with 50mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.
- 3.3 CUT AND BEND REINFORCEMENT  
Cut and bend bars using proper bending tools to avoid notching and to the requirements of [NZS 3109](#): 3.3 Hooks and bends. Minimum radii of reinforcement bends to [NZS 3109](#), table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.
- 3.4 ADJUSTMENTS  
Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.
- 3.5 TOLERANCES, BENDING  
To [NZS 3109](#), 3.9, Tolerances for reinforcement.
- 3.6 SECURE REINFORCEMENT  
Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums in [NZS 3109](#), 3.6, Spacing of reinforcement.
- 3.7 LAPPED SPLICES  
Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.  
Wire mesh laps to [NZS 3101](#).1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).
- 3.8 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229  
For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:  
  - the spacing of the cross wires plus 50mm
  - 150mm or
  - manufacturer's requirementsDo not count bar extensions beyond the outermost cross wire.

### 3.9 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

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

Location, cover to	<a href="#">NZS 3604</a>	<a href="#">NZS 4229</a>
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

### 3.10 CASTING IN

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

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

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

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

### 3.11 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with [NZS 3109](#), 5.6, Type B.

### 3.12 PRE-PLACEMENT INSPECTION

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

### 3.13 SURFACE FINISHES

To [NZS 3114](#), 105, Specification of finishes, as scheduled or as denoted on the drawings.

### 3.14 CONCRETE SURFACE TOLERANCES

To [NZS 3114](#), 104, Surface tolerances and [NZS 3114](#), 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

### 3.15 PUMPING CONCRETE

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

### 3.16 COMPACTION

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

### 3.17 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to [NZS 3604](#) as modified by [NZBC B1/AS1](#) and [NZBC E2/AS3](#). Construct to [NZS 3604](#), 4.5 **Concrete and concrete masonry** and [NZS 3604](#), 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by [NZBC B1/AS1](#), 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to [NZS 3114](#), 304, **Surface tolerances**.

Allow for free joints maximum 24m centres to [NZBC B1/AS1](#), 3.1.13 [NZS 3604](#) **New clause**.

### 3.18 SAW CUTS TO NZS 3604 OR NZS 4229

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

## 3.19 SPACING OF SAW CUTS

Spacing of sawcuts

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

## 3.20 SURFACE DEFECTS

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

## 3.21 CURING OF CONCRETE

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

## 3.22 CLEAN OUT

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

## 3.23 REMOVE

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

# 3820 CARPENTRY

## 1 GENERAL

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

### 1.1 DOCUMENTS

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

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.5	Specification for preservative treatment - Glue laminated timber products
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice
<b>*A copy of NZS 3604 Timber-framed buildings, must be held on site.</b>	

### 1.2 QUALIFICATIONS

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

### 1.3 DIMENSIONS

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

## 2 PRODUCTS

### 2.1 TIMBER FRAMING, TREATED

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

### 2.2 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 or H3.2 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings.

To [NZS 3602](#), table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

#### Components

### 2.3 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.

### 2.4 BOLTS AND SCREWS

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

### 2.5 NAIL PLATES

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

## 2.6 CONNECTORS

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

## 2.7 CORROSION RISKS

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

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

## 2.8 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

# 3 EXECUTION

## 3.1 EXECUTION GENERALLY

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

## 3.2 SEPARATION

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

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

## 3.3 ATTENDANCE

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

## 3.4 MOISTURE CONTENT

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

Framing at erection: 24% maximum

Framing at enclosure: 20% maximum

Framing at lining: 18% maximum

## 3.5 SET-OUT

Set out framing in accordance with the requirements of [NZS 3604](#) and as required to support sheet linings and claddings.

## 3.6 FRAMING WALLS

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

## 3.7 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

## 3.8 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to [NZS 3604](#). Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

## 3.9 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

## 3.10 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

# 4161 UNDERLAYS, FOIL AND DPC

## 1 GENERAL

This section relates to the application of:

- DPC/DPM
- underfloor foil insulation
- wall underlays includes Kraft based and synthetic wall underlays
- roofing underlays includes kraft based and synthetic roof underlays
- foils
- vapour barriers
- accessories

### 1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

NZMRM                      New Zealand Metal Roofing Manufacturers 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

### 1.2 DOCUMENTS

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

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZS/AS 1530.2</a>	Methods for fire tests on building materials, components and structures - Test for flammability of materials
<a href="#">NZS 2295</a>	Pliable, permeable building underlays
<a href="#">AS/NZS 2904</a>	Damp-proof courses and flashings
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">AS/NZS 4200.1</a>	Pliable building membranes and underlays
<a href="#">AS/NZS 4347.0</a>	Damp-proof courses and flashings - Methods of test - General introduction, list of methods and test specimen requirements
<a href="#">AS/NZS 4389</a>	Roof safety mesh
<a href="#">AS/NZS 4534</a>	Zinc and zinc/aluminium-alloy coatings on steel wire
<a href="#">NZMRM CoP</a>	NZ metal roof and wall cladding Code of Practice

### Requirements

### 1.3 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice.

## 2 PRODUCTS

### Materials

### DPC

### 2.1 POLYETHYLENE DPC

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

### DPM

- 2.2 DAMP PROOF MEMBRANE - CONCRETE FLOOR  
Polyethylene sheet with minimum thickness of 0.25mm to [NZS 3604](#), 7.5.6, **Polyethelene (polythene) sheet damp-proof membranes.**

### Wall Underlays

#### Roofing Underlay

- 2.3 BITUMINOUS SELF-SUPPORTING ROOFING UNDERLAY  
Self supporting roofing underlay tested to [NZS 2295](#).

#### Accessories

- 2.4 WINDOW DOOR SEALING SYSTEM  
Proprietary window and door flashing tape and accessories to E2/AS1, paragraph 4.3.11, **Flexible flashing tape**, paragraph 9.1.5, **Wall underlays to wall openings.**
- 2.5 STUD STRAPS  
19mm wide polyethylene straps, for cavity construction with framing centres greater than 450mm.
- 2.6 GUTTER AND UNDER FLASHINGS  
Bituminous breather type underlay cut to width by manufacturer for use under valley, apron flashing and internal gutters. Soffit liner cut to width from bituminous breather type underlay.
- 2.7 ADHESIVE TAPE  
Adhesive tapes to compliment the underlay. Pressure sensitive tapes for joining foil insulation and vapour barriers.

## 3 EXECUTION

### Conditions

- 3.1 GENERAL REQUIREMENTS  
To [NZBC E2/AS1](#) Table 23 Properties of Roof Underlays and Wall Underlays; and manufacturers technical literature.  
Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.
- 3.2 STORAGE  
Store wall and roofing underlays and accessory materials, under conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture.
- 3.3 INSPECTION  
Before starting work, check that the framing will allow work of the required standard. Carry out remedial work identified before laying underlay.

### Application - DPC

- 3.4 POLYETHYLENE DPC TO TIMBER  
Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.
- 3.5 DPC TO MASONRY AND BRICK VENEER  
Lay DPC along base of cavity and fix top edge to studs with galvanized clouts. Turn DPC out over concrete rebate under bottom course of veneer.
- 3.6 DPC BETWEEN DISSIMILAR MATERIALS  
Lay DPC between dissimilar materials where required.

### Application - DPM

### 3.7 DPM TO CONCRETE FLOOR

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

#### **Application - Wall Underlay**

### 3.8 WALL UNDERLAY

Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150mm to NZBC E2/AS1, clause 9.1.7, **Wall underlay** and refer to manufacturer for requirement for fastenings. Fix to manufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

### 3.9 INSTALL STUD STRAPS

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

#### **Application - Roofing Underlay**

### 3.10 ROOF UNDERLAY

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

### 3.11 GUTTER AND UNDER FLASHINGS

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

#### **Completion**

### 3.12 CLEAN UP

Clean up as the work proceeds.

### 3.13 LEAVE

Leave work to the standard required by following procedures.

### 3.14 REMOVE

Remove debris, unused materials and elements from the site.

# 4231HL JAMES HARDIE LINEA® CLADDING

## 1 GENERAL

This section relates to the supply and fixing of the following fibre cement products:

- James Hardie Linea® Weatherboard cladding

### Documents

#### 1.1 DOCUMENTS

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

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC E2/VM1</a>	Weathertightness
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
<a href="#">AS/NZS 2908.2</a>	Cellulose-cement products - Flat sheet
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie documents relating to this part of the work:

Linea® Weatherboard Technical Specification

[BRANZ Appraisal 447](#) - Linea® Weatherboard Cavity Cladding

Manufacturer/supplier contact details

Company: James Hardie New Zealand

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

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

Telephone: Contact James Hardie™ on 0800 808 868

BRANZ appraisal is available at [www.branz.co.nz](http://www.branz.co.nz).

CodeMark™ Certificate is available at [www.building.govt.nz](http://www.building.govt.nz)

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER - LINEA® WEATHERBOARD

Provide a material manufacturer/supplier warranty:

25 years: For Linea® Weatherboard product (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

#### 1.4 QUALIFICATIONS - NON-CODEMARK INSTALLATION

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

#### 1.5 NO SUBSTITUTIONS

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

#### 1.6 INFORMATION FOR OPERATION AND MAINTENANCE

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

### Requirements - Linea® Weatherboard

1.7 LINEA® WEATHERBOARD INSTALLATION INFORMATION

Installer to comply with all the relevant information in;

- Linea® Weatherboard Technical Specification; and,
- Cavity construction [BRANZ Appraisal 447](#)

**Performance**

1.8 PERFORMANCE, WIND

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

**2 PRODUCTS**

**Materials**

2.1 LINEA® WEATHERBOARDS

James Hardie Linea® Weatherboards, bevel back, 16mm thick, pre-primed, manufactured from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving, manufactured to [AS/NZS 2908.2](#), tested to [NZBC E2/VM1](#) for weathertightness and complying with the NZBC.

2.2 WALL UNDERLAY

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

2.3 EXTERIOR CAVITY BATTENS

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

**Components - Linea® Weatherboards**

2.4 SOAKERS

External metal corner soaker. Refer to SELECTIONS.

2.5 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated PVC, with upstands.

2.6 JH CORNER UNDER FLASHING

50 x 50mm PVC moulding.

2.7 CANT STRIP

Cant strip, uPVC profiled strip.

2.8 FASTENER TYPE

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

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

Zone	Fixings Material
Zone B, Zone C	Hot-dipped galvanized

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

2.9 CAVITY GALV STEEL CONCEALED NAILING OVER BATTENS & FLEXIBLE UNDERLAY

Hot-dipped galvanized, 60 x 3.15mm HardieFlex™ nails for Linea® Weatherboard concealed nailing over cavity battens over flexible underlay into timber stud.

**Accessories**

2.10 SEALANT

Silaflex AT-Facade sealant.

### 3 EXECUTION

#### Conditions

#### 3.1 STORAGE

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

#### 3.2 HANDLING

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

#### 3.3 SUBSTRATE - TIMBER FRAMING

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

#### Application - generally

#### 3.4 INSTALL CAVITY BATTENS

Install 18mm minimum thick cavity battens to [NZBC E2/AS1: 9.0 Wall claddings](#), where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the wall underlay. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

#### 3.5 PENETRATIONS AND FLASHINGS

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

- Wall underlay appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the wall underlay.
- Wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations.
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

#### 3.6 INSTALL LINEA® WEATHERBOARDS

Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Fit internal corners and fix weatherboards as per Linea® Weatherboard technical specifications. Fit and fix external corners and flexible sealant to tongue and groove joints as required.

#### 3.7 INSTALL FLASHINGS

Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to [NZBC E2/AS1](#).

#### Completion

#### 3.8 REPLACE

Replace all damaged or marked elements.

#### 3.9 LEAVE

Leave work to the standard required for following procedures.

#### 3.10 REMOVE

Remove debris, unused materials and elements from the site.

# 4261 BRICK VENEER CLADDING

## 1 GENERAL

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

- Standard brick veneer cladding

### Documents

#### 1.1 DOCUMENTS

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

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC B1/AS3</a>	Structure
<a href="#">NZS 1170.5</a>	Structural design actions - Earthquake actions - New Zealand
<a href="#">AS/NZS 2699.1</a>	Built-in components for masonry construction - Wall ties
<a href="#">AS/NZS 2699.3</a>	Built-in components for masonry construction - Lintels and shelf angles (durability requirements)
<a href="#">AS/NZS 2918</a>	Domestic solid fuel burning appliances - Installation
<a href="#">NZS 3103</a>	Sands for mortars and plasters
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4210</a>	Masonry construction: materials and workmanship
<a href="#">SNZ HB 4236</a>	Masonry veneer wall cladding
<a href="#">AS/NZS 4455</a>	Masonry units and segmental pavers
<a href="#">BRANZ</a>	Good practice guide: Masonry veneer

### Requirements

#### 1.2 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 Mason or licensed building practitioner (LBP): Licensed for Bricklaying and Blocklaying 1: Brick/masonry Veneer. RBW must be supervised by an LBP.

#### 1.3 NO SUBSTITUTIONS

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

### Compliance information

#### 1.4 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Producer Statement - Construction from the installer of Two Storey Brick Veneer System.
- Other information required by the BCA in the Building Consent Approval documents.

### Performance

#### 1.5 DESIGN PARAMETERS - NON SPECIFIC DESIGN

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

#### 1.6 COMPLIANCE

Brickwork to comply with [SNZ HB 4236](#) Masonry veneer wall cladding.

## 2 PRODUCTS

### Materials

- 2.1 CLAY BRICKS  
To [AS/NZS 4455](#).
- 2.2 VERMIN STOP  
Galvanized hexagon 10mm mesh of 1mm diameter steel wire 100mm wide, complete with galvanized steel staples.
- 2.3 DAMP-PROOF MEMBRANE  
Heavy kraft, strip laminates saturated and coated with bitumen, butyl rubber sheet with adhesive, or equivalent.
- 2.4 DAMP-PROOF COURSE  
Polyethylene based strip used as a damp-proof course and flashing, also for slip joints between brick courses.

### **Components - standard brick veneer**

- 2.5 WALL TIES  
To [AS/NZS 2699.1](#). Veneer ties screw fixed to framing.
- 2.6 REINFORCEMENT  
Galvanised wire joint reinforcement

### **Accessories**

- 2.7 SAND FOR MORTAR  
To [NZS 3103](#). Chloride levels to not exceed 0.04% by dry weight of sand.
- 2.8 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.
- 2.9 ADMIXTURES  
To [NZS 4210](#).
- 2.10 WATER  
Clean, fresh and free from excess alkali, salt, silt and organic materials.

## **3 EXECUTION**

### **Conditions**

- 3.1 TOLERANCES  
To [NZS 4210](#), table 2.2 Maximum tolerances.
- 3.2 HANDLING AND STORAGE OF MATERIALS  
To [NZS 4210](#) for aggregates, cement, bricks and reinforcement.
- 3.3 CONCRETE BASE  
Check vertical and horizontal alignment. Any discrepancies exceeding the permitted tolerances shall be corrected before units are laid.
- 3.4 TIMBER FRAMING  
Check timber framing stud spacing is in accordance with [NZS 3604](#).

### 3.5 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).

### 3.6 MEASURE MATERIALS

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

### 3.7 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.

### 3.8 COLD WEATHER CONSTRUCTION

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

### 3.9 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.

### 3.10 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**

### 3.11 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 1500mm 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 STOP

Fold and staple one edge of the mesh to the substrate and with the mesh sloping outwards, set the other edge half the thickness of the veneer or 50mm, whichever is less, into the mortar joint.

### 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 CAVITY WIDTH

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

### 3.25 PLACE TIES

Place 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 300mm or 2 courses, whichever is the smaller

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

- Not more than 300mm
- 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**

### 3.26 BUILD IN FIXINGS

Build in necessary fixing bricks or blocks for trims.

### 3.27 BUILD IN ELEMENTS

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

### 3.28 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**

### 3.29 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.

3.30 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.

3.31 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.

# 4323G STEEL TILE ROOFING

## 1 GENERAL

### 1.1 ABBREVIATIONS

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

NZMRM                      New Zealand Metal Roofing Manufacturers Inc

#### Documents

### 1.2 DOCUMENTS

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

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood based products for use in building
NZS 3604	Timber-framed buildings
NZS 4217	Pressed metal tile roofs
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

#### Requirements

### 1.3 QUALIFICATIONS

Carry out the roofing work with trained, experienced, competent installers familiar with the products being used.

#### Performance

### 1.4 FIXINGS, WIND

Design and use the fixings appropriate to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT. To [NZS 3604](#) table 10.12 **Tile Battens for all wind zones**.

### 1.5 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.

### 1.6 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. Comply with the [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, sections 2 to 7 (Performance, Loadings, Design, Flashings, Penetrations and Installation), and section 10, Pressed metal Tiles.

## 2 PRODUCTS

#### Materials

### 2.1 UNDERLAY

Breather type roof underlay.

### 2.2 BATTENS

To [NZS 3604](#), 10.2.1.16 **Purlins and tile battens**. Radiata Pine or Douglas Fir, SG6, treated H1.2. Moisture content to [NZS 3602](#), size, spacing and fixing to [NZS 3604](#) table 10.12 **Tile Battens for all wind zones**.

### 2.3 PRESSED METAL TILES

To [NZS 4217](#), and [NZBC E2/AS1](#), 8.3 Pressed metal tiles. Refer to SELECTIONS for type.

#### Components

- 2.4 NAILS  
Hot-dipped galvanized steel flat head 50mm x 2.8mm nails to GERARD® Roofs specification.
- 2.5 FLASHINGS, CAPPINGS AND COVERS  
To NZS E2/AS1, 4.0 **Flashings**. Use ridge and hip caps, barge covers, general purpose malleable-edged flashings and side flashings.

### 3 EXECUTION

#### Conditions

- 3.1 INSPECTION  
Inspect the roof framing and supporting structure and do not start work until it is complete and fully braced ready for tiling, all to the requirements of [NZS 3604](#) or specific design where required.
- 3.2 STORAGE  
Stack tiles on a level, hard base, ventilated and protected from damage and weather.
- 3.3 HANDLING  
Unload and handle tiles without soiling, scratching, crushing or other damage.
- 3.4 COMPLY  
Comply with the preparation, laying and fixing requirements of [NZS 4217](#), [NZBC E2/AS1 8.0 Roof claddings](#),

#### Application

- 3.5 SET-OUT  
Carefully set out the roof with a measuring rod to position the battens accurately taking account of rafter lengths, overhangs into gutters and spoutings and verge overhangs, all to minimise tile cutting.
- 3.6 LAY UNDERLAY  
Lay roof underlay, drawn tight, over rafters from ridges and hips, over fascia into gutters and into valleys to [NZS 4217](#) and [NZBC E2/AS1: 8.1.5 Underlays](#). Fix without any damage. If damaged make good with full lap inserts as the work proceeds.
- 3.7 FIX BATTENS  
To [NZS 3604](#). Fix battens over the underlays in straight courses, spanning at least 3 rafters, between fascia and ridge and elsewhere to required details. Nail at every crossing to [NZS 3604](#), table 10.12. Square cut ends to form butt joint over rafters with joints staggered.
- 3.8 LAYING  
Do not take heavy equipment onto the roof. Plan work to minimise foot traffic. Work on the roof only using appropriate footwear. Interlock, lap and lay tiles to [NZBC E2/AS1: 8.3 Pressed metal tiles](#). Finish ridge, hip, valley, barge and eaves to required details if not detailed elsewhere.
- 3.9 NAILING TILES  
Nail tiles to battens generally through the upstand and downturn of the tile lap as well as all elements to details and to [NZBC E2/AS1](#). Fix bottom course of satin finish tiles with vertical nails with butyl/EPDM washers. Fix the bottom course of textured tiles with vertical nails and cover heads with touch up materials.
- 3.10 CUTTING AND BENDING  
Cut, bend and straighten tiles neatly to finish true to line and plane when in place, using installation equipment maintained in the proper condition, all to [NZS 4217](#)
- 3.11 FIT FLASHINGS, COVERS AND CAPPINGS  
Cut, fit and fix all elements true to line and plane, to [NZBC E2/AS1: 4.0 Flashings](#), [NZBC E2/AS1: 5.0 Roof/wall junctions](#), to details and the [NZMRM CoP NZ metal roof and wall cladding Code of Practice](#), section 10, if not detailed elsewhere.

### 3.12 PENETRATIONS

Form to [NZBC E2/AS1: 8.1.7 Roof penetrations](#), and to the [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice.

### 3.13 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing.

Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:

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

### Completion

#### 3.14 MAKE GOOD

Touch up all damaged coatings with finishing kit.

#### 3.15 LEAVE

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

#### 3.16 REMOVE

Remove trade rubbish and unused materials from the roof and surrounds regularly during the work. Sweep down the completed roof and clean out spoutings, gutters and rainwater pipes. Remove debris, unused materials and elements from the site.

# 4610 GLAZING RESIDENTIAL

## 1 GENERAL

This section relates to the supply and fixing of glass products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- mirrors

### 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:

PVB	Polyvinyl Butyral
CIP	Cast in place

### Documents

### 1.2 DOCUMENTS

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

NZBC F4/AS1	Safety from falling
NZBC H1/AS1	Energy Efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4218	Thermal insulation - Housing and Small Buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 337	Protecting window glass from damage

### Warranties

### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

### Performance

### 1.4 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.

## 2 PRODUCTS

### Materials

- 2.1 CLEAR FLOAT GLASS  
Clear ordinary annealed transparent float glass for general window glazing. Thickness to [NZS 4223.1](#) and [NZS 4223](#). Supp 1.
- 2.2 LAMINATED GLASS  
Grade A Safety Glass to [AS/NZS 2208](#) with PVB or CIP resin interlayer.
- 2.3 TOUGHENED GLASS  
Grade A Safety Glass to [AS/NZS 2208](#).
- 2.4 INSULATING GLASS UNITS (IGU'S)  
To [AS/NZS 4666](#), [NZS 4223.2](#) and the IGU Manufacturers Association (IGUMA) requirements. Marking to [NZS 4223.2](#) as modified by [NZBC B2/AS1](#), 3.5.

### **Materials, mirrors**

- 2.5 SAFETY MIRROR GLASS  
4mm, 5mm and 6mm annealed float glass mirror vinyl back safety glazing material to [AS/NZS 2208](#).

### **Materials, screens**

- 2.6 GLASS SCREENS SHOWER & BATH  
Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

### **Components, aluminium and uPVC glazing**

- 2.7 GLAZING TAPE AND GASKETS  
Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.
- 2.8 SETTING BLOCKS  
Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

### **Components, wall mounted glass (mirrors and splashbacks)**

- 2.9 GLASS ADHESIVE  
Adhesive mirror-mastic and double-sided adhesive tape.

## **3 EXECUTION**

### **Conditions**

- 3.1 GENERAL REQUIREMENTS  
To [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#). All external glazing to be wind and watertight on completion.
- 3.2 DELIVERY  
Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 337.
- 3.3 GLASS CONDITION  
All glass to have undamaged edges and surfaces.
- 3.4 GLASS THICKNESS  
If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#) and [NZS 4223](#). Supp 1. For windows tested to [NZS 4211](#), ensure glass meets the requirements of the window testing. Determine the final glass thickness based on whether wind loading or human impact considerations govern.

### 3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to [NZS 4223.1](#), Section 4 Glazing.

### 3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

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

#### **Conditions - human impact safety requirements**

### 3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) for thickness and maximum areas of safety glass.

### 3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in [NZS 4223.3](#), that also comply with the relevant requirements of [AS/NZS 2208](#). Ensure material is permanently marked and if cut by the distributor or installer mark each piece to [NZS 4223.3](#), 2.8 Identification.

### 3.9 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

#### **Assembly**

### 3.10 WORKING OF GLASS

All working of glass as required in [NZS 4223.1](#).

### 3.11 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

### 3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

### 3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

### 3.14 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

#### **Application aluminium**

### 3.15 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to [NZS 4223.1](#).

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

#### **Application - wall mounted glass (mirrors and splashbacks)**

### 3.16 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m<sup>2</sup> per 1 m<sup>2</sup> of glass to [NZS 4223.3](#).

#### **Application miscellaneous**

### 3.17 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

#### **Finishing**

3.18 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

**Completion**

3.19 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

3.20 REPLACE

Replace damaged, cracked or marked glass.

3.21 LEAVE

Leave work to the standard required by following procedures.

3.22 REMOVE

Remove debris, unused materials and elements from the site.

# 6221M MAPEI® TILING SOLUTIONS

## 1 GENERAL

This section relates to floor and wall tiling systems with Mapei® tiling products:

- primers / sealers
- acoustic underlays
- wet area membranes
- adhesives
- grouts
- sealants

### Documents

#### 1.1 DOCUMENTS

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

<a href="#">NZBC D1/AS1</a>	Access routes
<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC E3/AS1</a>	Internal moisture
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS 4586	Slip resistance classification of new pedestrian surface materials
<a href="#">NZS 4121</a>	Design for access and mobility - Buildings and associated facilities
BRANZ	Good practice guide: Tiling

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Mapei New Zealand Ltd documents relating to this part of the work:

Mapei® catalogue - Products for Ceramics and Stone Products

Mapei® product Technical Data Sheets

[BRANZ Appraisal 484](#) - Mapegum WPS, Mapelastic, Mapelastic Smart, Mapelastic Turbo and Mapelastic AquaDefense Wet Area Membranes

[BRANZ Appraisal 485](#) - Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes

Manufacturer/supplier contact details

Company: Mapei New Zealand Ltd

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

Email: [enquiries@mapei.co.nz](mailto:enquiries@mapei.co.nz)

Telephone: 09 921 1994

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a tile manufacturer/supplier warranty:

2 years: For tiling products

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

Refer to the general section 1237 WARRANTIES for additional requirements.

**1.4 WARRANTY - MANUFACTURER/SUPPLIER**

Provide a Mapei® products manufacturer/supplier warranty:

15 years:	For Mapelastic AquaDefense, Mapelastic Smart and Mapegum WPS
10 years	For other Mapei® tiling products

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

Refer to the general section 1237 WARRANTIES for additional requirements.

**1.5 WARRANTY - INSTALLER/APPLICATOR**

Provide an installer/applicator warranty:

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

Refer to the general section 1237 WARRANTIES for additional requirements.

**Requirements****1.6 QUALIFICATIONS**

Installers to be experienced, competent trades people familiar with the materials and techniques specified. Mapei® waterproof systems must only be installed by Mapei® approved applicators.

**1.7 NO SUBSTITUTIONS**

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

**1.8 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.

**Performance****1.9 SLIP RESISTANCE – SURFACES EXEMPT FROM TESTING**

Slip resistance for walking surfaces comply with [NZBC D1/AS1](#), Table 2.

**1.10 INTERNAL / EXTERNAL MOISTURE**

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

**2 PRODUCTS****Materials - floor covering****2.1 TILES**

Refer to SELECTIONS for option.

**Primers/sealers****2.2 TIMBER PRIMER**

Primer S, a waterproofing primer in water dispersion.

**2.3 GENERAL PURPOSE PRIMER**

Primer G, a synthetic resin-based primer in water dispersion.

**2.4 CONSOLIDATING PRIMER**

Primer 3296, is an acrylic polymer-based water dispersion primer.

**2.5 LEVELING COMPOUND PRIMER**

Eco Prim T, is a solvent free acrylic primer in water dispersion.

- 2.6 NON-PORUS SUBSTRATE PRIMER  
Mapeprim SP, a two-part solvent free primer.
- 2.7 NON-PORUS SUBSTRATE PRIMER - SINGLE COMPONENT  
ECO Prim Grip, is a solvent-free one component acrylic primer of synthetic resin in water dispersion.
- 2.8 MOISTURE BARRIER EPOXY-CEMENTITIOUS PRIMER  
Triblock P, a three-component, epoxy-cementitious primer for damp substrates.

### **Adhesives**

- 2.9 GENERAL PURPOSE RUBBER MODIFIED CEMENTITIOUS ADHESIVE  
Adeflex R, a premium grade deformable rubber modified cement based adhesive, for interior and exterior installation (upper North Island only) of ceramic tiles and natural stone.
- 2.10 RAPID SETTING ADHESIVE - CERAMIC TILES/NATURAL STONE  
Granirapid, a high performance, deformable, fast setting and hydrating two- component cementitious adhesive.
- 2.11 CEMENT BASED POWDER ADHESIVE AND ADDITIVE  
Kerabond Plus, a cement based powder mixed with Isolastic, a latex additive to impart elasticity.
- 2.12 NON-PORUS SUBSTRATE SPECIAL PURPOSE ADHESIVE  
Keralastic T, a high performance, two component, polyurethane adhesive for ceramic tiles and natural stone.
- 2.13 MULTI SUBSTRATE CEMENT BASED ADHESIVE  
Keraflex Maxi S1, a high performance, deformable cementitious adhesive with extended open time and no vertical slip for ceramic tiles and stone material, with Low Dust Technology.
- 2.14 CEMENT BASED POWDER ADHESIVE AND ADDITIVE - RAPID SETTING  
Keraquick S1 zero, a high performance, deformable, fast setting cementitious adhesive with no vertical slip, mixed with Latex Plus, a latex admixture introducing elasticity to provide improvement of deformability.
- 2.15 EPOXY ADHESIVE  
Kerapoxy Adhesive, a two component epoxy adhesive with no vertical slip for ceramic tiles and natural stone material.
- 2.16 PREMIXED ADHESIVE  
Ultramastic III, a high performance, ready to use paste adhesive with no vertical slip and extended open time, for ceramic tiles.
- 2.17 CEMENT BASED ADHESIVE – MESH BACKED MOASICS  
Adesilex P10, a high performance white cementitious adhesive with no vertical slip for bonding of glass, ceramic and marble mosaics.

### **Grouts**

- 2.18 POLYMER-MODIFIED MULTI-PURPOSE CEMENTITIOUS GROUT  
Ultracolor Plus, a fast setting and drying, high performance, polymer-modified, anti-efflorescence, water-repellent grout for joints from 2mm to 10mm, with DropEffect and anti-mould with BioBlock technology.
- 2.19 EPOXY GROUT  
Kerapoxy, a high performance, two-component, acid-resistant epoxy grout for joints of at least 3mm, for ceramic tiles and natural stone material.

### **Sealants**

- 2.20 MULTI-PURPOSE SILICON SEALANT  
Mapesil AC and Primer FD, a solvent-free, acetic cross-linking mildew-resistant silicon sealant with an associated adhesive enhancing primer.

- 2.21 NEUTRAL SILICON SEALANT - NATURAL STONE  
Mapesil LM, an odourless one-component neutral cross-linking, silicon sealant for natural stone.
- 2.22 SINGLE COMPONENT POLYURETHANE SEALANT  
Mapeflex PU45, a single component, thixotropic, rapid hardening polyurethane sealant and adhesive with a high modulus of elasticity.
- 2.23 SINGLE COMPONENT POLYMER-BASED SEALANT AND ADHESIVE  
Mapeflex MS45, a single component flexible, thixotropic, quick-hardening sililated polymer-based hybrid sealant and adhesive with a high modulus of elasticity.

#### **Components - waterproofing**

- 2.24 WATERPROOFING MEMBRANE SYSTEM - INTERIOR USE  
Mapegum WPS, a fast drying, synthetic resin-based liquid elastic membrane for interior waterproofing. To reinforce protection layers, anti-fracture and cementitious smoothing and levelling layers use Mapetex Sel waterproof reinforcing mesh. To waterproof edges and expansion joints use Mapeband, Mapeband PE 120 or Mapeband SA

#### **Components - cleaning**

- 2.25 GROUT & TILE CLEANING AGENT  
Keranet, an acid-based general tile cleaner.
- 2.26 CLEANER  
Kerapoxy Cleaner, a high performance cleaner for epoxy grout.
- 2.27 SOLVENT GEL  
Pulicol 2000, a solvent based gel for removing old natural and synthetic resin-based adhesives, paint and grouts/grout residue.

#### **Accessories**

- 2.28 UNDERTILE HEATING  
Proprietary electric undertile heating system complete with thermostat/controller. Refer to 7553 UNDERFLOOR HEATING MAT SYSTEM for undertile heating.
- 2.29 STRIPS AND WEATHERBARS  
Unless otherwise specified edge strips, floor finish divider strips and weather bars shall be aluminium.
- 2.30 EXPANSION JOINT, METAL AND RUBBER  
Clear anodised aluminium/brass with metal anchor to set into in-situ concrete, cement screed/bed and complete with rubber infill.
- 2.31 EXPANSION JOINT, METAL AND COMPOUND  
Aluminium/brass angles with high density foam rubber insert and jointing compound.
- 2.32 EXPANSION JOINT, PLASTIC  
Rigid stabilised PVC sides with flexible central section.

### **3 EXECUTION**

#### **Conditions**

- 3.1 DELIVERY, STORAGE AND HANDLING  
Take delivery of materials and goods and store on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle goods in accordance with manufactures requirements. Reject and replace goods that are damaged or will not provide the required finish

### 3.2 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements. Check that maximum variation in the plane of the substrate is no greater than  $\pm 4\text{mm}$  in 2 lin.m. before commencing tiling.

### 3.3 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.

### 3.4 CONFIRM LAYOUT

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

### 3.5 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.

### 3.6 BACKGROUND MATERIALS

Ensure that the installation of background materials and substrate materials meets relevant standards and the manufacturer's instructions. Inspect background and substrate materials for any conditions unsuitable for tiling over. Do not commence work until the affected area is rectified. Confirm any specific preparation required for the adhesive being used.

### 3.7 PREPARATION OF BACKGROUNDS

Prepare backgrounds in accordance with AS 3958.1, section 4 and in accordance with the Mapei® instructions for the selected substrate.

### 3.8 FALLS

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5mm over 3 metres. Unless otherwise specified form screeds with the following falls:

Unless stated otherwise provide minimum fall gradients to BRANZ Good Practice Guide - Tiling, clause 6.6 Falls in floors.

1 : 40 minimum	For tiled decks which also act as a roof
1 : 60 minimum	For paving over ground
1 : 50 minimum	For unenclosed shower bases (to <a href="#">NZBC E3/AS1</a> , 3.3.5)
1 : 60 minimum	For enclosed shower bases
1 : 50 minimum	For shower bases for people with disabilities (to <a href="#">NZS 4121</a> , 10.5.11.3 (b).)
1 : 60 minimum	For commercial kitchens or similar

### 3.9 WATERPROOFING WET AREAS

Areas to be waterproofed shall be in accordance with [NZBC E3/AS1](#), AS 3740 and BRANZ Good Practice Guide -Tiling Section 7: Waterproofing interior wet areas, as shown on the drawings or stated in SELECTIONS.

### 3.10 SERVICES AND ACCESSORIES

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.

### 3.11 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will allow for tile laying of the required standard.

### 3.12 SUBSTRATE TEMPERATURE

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

### 3.13 MOISTURE CONTENT

Ensure the floor is dry and 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.

## Application

### 3.14 APPLICATION GENERALLY

Prepare backgrounds as described in AS 3958.1, Section 4. Suitably prepare backgrounds and substrates in accordance with the manufacturer's instructions to receive the bedded finish. Remove all dirt, dust, grease, oil, loose particles and any other form of contamination or deleterious material. Ensure that substrates are sound and dry.

Installation to be in accordance with AS 3958.1, Section 5, including setting out, fitting, movement joints, sealants, tile finish and joints, and grouting.

Application of primers/ sealers, undertile membranes, waterproofing, adhesives grouts and sealants to comply with MAPEI® technical data sheets and application details for specific products.

### 3.15 SUBSTRATE PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION for preparation of substrates for laying of ceramic tiles and natural stone.

### 3.16 PRIMERS/SEALERS

Apply primers to MAPEI® technical data sheets and application details for specific product.

### 3.17 WET AREA MEMBRANE WATERPROOFING

Apply wet area waterproofing systems in accordance with MAPEI® technical data sheets and requirements.

### 3.18 SETTING OUT

Setting out, cutting and fitting of tiles to be as described in AS 3958.1, clauses 5.4.2 and 5.4.3. Set out tiling as shown on the drawings. Confirm bond and pattern before installing. Provide even and correct falls to floor tiles where required, including falls to floor wastes. Ensure that a level finish is provided at wall lines. Where falls are not required ensure that the tiles are laid level.

### 3.19 TILE FINISH AND JOINTS

Provide tile finish and joints, including tolerances, as described in AS 3958.1, clause 5.4.6. Joint widths to be suited to tile and in accordance with the manufacturer's instructions.

### 3.20 MOVEMENT JOINTS

Install movement joints with a minimum joint width of four times the expected movement. Provide a 9 to 10mm minimum joint width for exterior joints at 3.6m maximum spacings and a 12mm minimum joint width for 4.8m maximum spacings. Increase joint width by 1.5mm for each 10°C over or below a 35°C temperature range.

Provide movement control joints:

- to coincide with control joints in the substrate / structure.
- where substrate material changes.
- where tiles are restrained by building elements.
- where flexing of the structure will occur.
- to the perimeter of tiles that abut another material.
- where tile surfaces change in plane.
- where tile type changes.
- radiating from an external corner of an L-shaped tiled area

Provide movement joints at 4.5m spacing to tiled floors exposed to direct sunlight and at 6m maximum spacing for shaded internal tiled floors (reduce these spacings by 15 to 20% for flexible organic adhesives).

Provide movement joints at 3 to 4.5m centres along the length of internal and external walls (reduce these spacings by 15 to 20% for flexible organic adhesives) and at storey heights.

### 3.21 APPLY ADHESIVE

Apply and float thick or thin bed of cement based adhesive to 6mm maximum and 3mm minimum bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with 3mm grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

**3.22 GROUTING**

Apply grout to tiling in accordance with Mapei® technical data sheets and application details for specific product and as described in AS 3958.1, clause 5.7.

**3.23 SEALING**

Apply sealants to tiling in accordance with Mapei® technical data sheets and application details for specific product.

**3.24 CLEAN TILES**

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Use Mapei Keranet to clean tiles of cementitious residue as necessary and Mapei Kerapoxy Cleaner to remove residues of epoxy grout from tile surfaces. Finally polish glazed tiles with a clean dry cloth.

**Completion****3.25 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.

**3.26 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.

# 7420 SANITARY SYSTEMS

## 1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

### 1.1 DOCUMENTS

Documents referred to in this section are:

<a href="#">NZBC G1/AS1</a>	Personal hygiene
<a href="#">NZBC G13/AS1</a>	Foul water - Sanitary plumbing
<a href="#">NZBC G13/AS3</a>	Plumbing and drainage
<a href="#">AS 2887</a>	Plastic waste fittings
<a href="#">AS/NZS 1260</a>	PVC-U pipes and fittings for drain, waste and vent applications
<a href="#">AS/NZS 2032</a>	Installation of PVC pipe systems
<a href="#">AS/NZS 3500.2:2003</a>	Plumbing and drainage - Sanitary plumbing and drainage
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	

### 1.2 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

## 2 PRODUCTS

### 2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to [AS/NZS 1260](#) complete with fittings brand-matched to the pipe manufacturer's requirements.

### 2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.  
White polybutylene or PVC, including all associated fittings.

## 3 EXECUTION

### 3.1 EXECUTION GENERALLY - AS/NZS 3500.2

Carry out this work and complete all tests to [NZBC G1/AS1: 2.0, 3.0](#) and [AS/NZS 3500.2:2003](#), as modified by [NZBC G13/AS3](#).

### 3.2 ELECTROLYTIC ACTION

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

### 3.3 INSTALL TRAPS, WASTE AND VENT PIPES - AS/NZS 3500.2

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to [AS/NZS 3500.2:2003](#), as modified by [NZBC G13/AS3](#), 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

Test soil and waste disposal systems to ensure no leakage exists and leave in proper working order.

### 3.6 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

# 7430 DRAINAGE

## 1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

### 1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

<a href="#">NZBC B1/AS1</a>	Structure
<a href="#">NZBC E1/AS1</a>	Surface water
<a href="#">NZBC G13/AS2</a>	Foul Water
<a href="#">NZBC G13/AS3</a>	Plumbing and Drainage
<a href="#">AS/NZS 1254</a>	PVC-U pipes and fittings for Stormwater and Surface Water applications
<a href="#">AS/NZS 1260</a>	PVC-U pipes and fittings for drain, waste and vent applications
<a href="#">AS/NZS 2032</a>	Installation of PVC pipe systems
<a href="#">AS/NZS 2033</a>	Installation of Polyethylene pipe systems
<a href="#">AS 2439.1</a>	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
<a href="#">AS/NZS 2566.1</a>	Buried Flexible Pipelines - Structural Design
<a href="#">AS/NZS 2566.2</a>	Buried Flexible Pipelines - Installation
<a href="#">NZS 3104</a>	Specification for concrete production
<a href="#">AS/NZS 3500.2</a>	Plumbing and drainage - Sanitary plumbing and drainage
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4229</a>	Concrete masonry buildings not requiring specific engineering design
<a href="#">AS/NZS 4671</a>	Steel reinforcing materials
<a href="#">AS/NZS 5065</a>	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	

### 1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

### 1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

## 2 PRODUCTS

### 2.1 CONCRETE

17.5 MPa prescribed mix to [NZS 3104](#).

### 2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to [AS/NZS 4671](#).

### 2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to [AS/NZS 1254](#) and [AS/NZS 1260](#). Underground PVC-U pipe to be Classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

### 2.4 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to [AS/NZS 3500.2](#), 4.6 Gullies, as modified by [NZBC G13/AS3](#).

## 2.5 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding & surround: Crushed rock or gravel screenings of nominal size of 7 - 10 mm.  
Backfill material: Excavated material from the trench (free from rock, hard matter and organic material) containing no soil lumps larger than 75 mm.

## 3 EXECUTION

### 3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs. Trenches running parallel, below and close to foundations of buildings to [NZS 3604](#) or [NZS 4229](#) to be separated to:

- [NZBC E1/AS1](#), 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
- [NZBC G13/AS2](#), 5.6, **Proximity of Trench to Building**, for foul water drains.

### 3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

### 3.3 DRAINAGE GENERALLY - AS/NZS 3500.2 & NZBC E1/AS1

Carry out drainage work and tests to [AS/NZS 3500.2](#), as modified by [NZBC G13/AS3](#) (foul water), [NZBC E1/AS1](#) (stormwater). Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#), [NZS 2566.1](#) and [AS/NZS 2566.2](#). Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#) and [NZS 2566.1](#).

### 3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

### 3.5 INSTALL GULLY TRAPS

Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

### 3.6 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

### 3.7 CONCRETE ENCASUREMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

### 3.8 FIELD TEST

Field test drains for watertightness (PVC-U to [AS/NZS 2032](#) or [AS/NZS 2566.2](#) Appendix N) to the satisfaction of the territorial authority inspector.

### 3.9 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL FOR PVC-U PIPE

Place and rake in bedding material so as to support the pipe once laid. Embedment material shall be placed uniformly along and around the pipe to ensure uniform density of side support and overlay with no distortion, dislodgment or damage to the pipeline. Following placement, the embedment material shall be compacted in layers to uniformly support the pipe. Trench fill material shall be placed on the pipe embedment and compacted to fill the trench, with care taken to avoid impact loading of the pipe.

# 7701 ELECTRICAL BASIC

## 1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrically-powered fittings

### 1.1 ABBREVIATIONS AND DEFINITIONS

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

The following abbreviations apply specifically to this section:

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

## 1.2 DOCUMENTS

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

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC F7/AS1	Warning systems
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3	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 3100:2009	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 3350.1	Safety of household and similar electrical appliances - General requirements
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 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
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	

### Warranties

## 1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year: Warranty period

### Requirements

## 1.4 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.

## 1.5 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

**1.6 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.

**1.7 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.

**2 PRODUCTS****2.1 MAINS SUPPLY, SINGLE PHASE**

Tough plastic sheathed neutral screened cable to AS/NZS 4961 and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

**2.2 CABLES**

Tough plastic sheathed copper conductors to [AS/NZS 5000.2](#), stranded above 1.0mm<sup>2</sup>, and to [AS/NZS 3008.1.2](#). Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm <sup>2</sup> on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm <sup>2</sup> on 16 amp MCBs
Power circuits:	2.5mm <sup>2</sup> on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm <sup>2</sup> on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres

Hot water cylinder circuits: Single phase: 2.5mm<sup>2</sup> on 20 amp MCBs

Range/oven/hob circuits: Single phase: 6mm<sup>2</sup> 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.

**2.3 METER BOX**

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

**2.4 DISTRIBUTION BOARD**

Flush surface mount boards manufactured to [AS/NZS 3439.3](#) 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.

**2.5 CIRCUIT PROTECTION**

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with [AS/NZS 3190](#). MCBs to 4.5kA or 6kA rated.

**2.6 BATTEN HOLDERS**

Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

**2.7 DOOR BELL SYSTEM**

Complete with transformer for mounting on distribution board.

**2.8 RESIDENTIAL RECESSED LIGHT FITTINGS**

Residential recessed luminaires to [AS/NZS 60598.2.2](#), types IC-F, IC only.

## 2.9 EXHAUST FANS

Ceiling, wall or duct mounted exhaust fans for ventilation to [NZBC G4/AS1](#), and compliant with [AS/NZS 3350.1](#).

## 2.10 HEATED TOWEL RAILS

Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 3350.1](#), scratch resistant powdercoated or chrome finish.

# 3 EXECUTION

## 3.1 MAIN SUPPLY

Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.

## 3.2 METER BOX

Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to [NZBC E2/AS1](#) fig 69. Arrange for meter installation and connection.

## 3.3 DISTRIBUTION BOARD

Fit to [AS/NZS 3000](#) and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.

## 3.4 CIRCUIT PROTECTION

Install MCBs at distribution board to [AS/NZS3000](#) to protect each final sub circuit.

## 3.5 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to [AS/NZS 3000](#), the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

## 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 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

### 3.14 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](#).

### 3.15 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;

- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#);
- 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.

### 3.16 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.

### 3.17 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.

### 3.18 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](#) and the [NZBC G9/AS1](#)
- 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](#).

### 3.19 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.

### 3.20 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**

### 3.21 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

## 8990 SELECTIONS

### 1 GENERAL

#### 1.1 GENERAL

The following selections are to be read in conjunction with the related work sections, where they are available.

### 2 PRIMARY STRUCTURE

#### 2.1 CONCRETE

##### DAMP-PROOF MEMBRANE

Brand/type: 250 Micron

##### NORMAL CONCRETE

20 Mpa

#### 2.2 EXTERIOR WALL

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

##### CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1

#### 2.3 ROOF FRAMING

Member	Species	Grade	Treatment
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG6	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2

##### ROOF TRUSSES

Type/treatment: Radiata pine, Grade SG8, Treated H1.2  
Truss supplier: Prenail Systems, Levin

#### 2.4 EXTERIOR TIMBER

Member	Species	Grade	Treatment
Posts:	Radiata pine	SG8	H5 CCA

Note all CCA to be preservative code 01 or 02

##### EXTERIOR FINISHING TIMBERS

Member	Species	Grade	Treatment
Weatherboards:	Radiata pine	Dressing	H3.1
Fascia/arge/cover boards:	Radiata pine	Dressing	H3.1
Exterior trim:	Radiata pine	Dressing	H3.1

#### 2.5 INTERIOR TIMBERS

##### INTERIOR FRAMING

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

##### INTERIOR FINISHING TIMBERS

Member	Species	Grade
Architraves:	Radiata pine	Dressing
Skirtings:	Radiata pine	Dressing
Cornices:	Radiata pine	Dressing

### 3 ENCLOSURE

3.1 DPC & UNDERLAYS

DPC

Location: Refer details  
 Brand / type: Thermakraft Polyethylene - Supercourse 500

DPM

Location: Under slab  
 Brand / type: 250 Micron polyethylene DPM  
 Jointing tape: PVC

WALL UNDERLAY

Location: Exterior walls  
 Brand / type: Marshall Tekton

ROOFING UNDERLAYS

Location: Roof  
 Brand / type: Thermakraft 215

**Accessories** Choose proprietary self adhering window and door flashing tape.

AIR SEAL BACKING ROD

Location: Refer details  
 Brand / type: Thermakraft window worm or equivalent  
 Size: 8mm

WINDOW FLASHING TAPE

Brand/Type: Marshall Protecto wrap

3.2 BRICK VENEER

Materials - standard brick veneer

CLAY BRICKS

Brand: Austral  
 Size: 70 series  
 Laying pattern: Stretcher bond  
 Pointing: Raked

Components - standard brick veneer

WALL TIES

Brand/type: Lumberlok Screw ties &ndash; or competitors equivalent  
 Material: HD Galv

3.3 JAMES HARDIE WEATHERBOARD - LINEA

CAVITY BATTENS

Timber species: Radiata pine  
 Treatment: H3.1

JAMES HARDIE LINEA WEATHERBOARDS

Location: Refer elevations  
 Brand/type: James Hardie Linea Weatherboard  
 Thickness: 16mm  
 Width: 180mm  
 Nails: Galv Jolt head

JAMES HARDIE LINEA WEATHERBOARD CORNERS

Type: Soaker

3.4 STEEL TILE ROOFING

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

SHAKE STEEL TILES

Finish: Satin  
 Colour: TBC

4 OPENINGS AND THERMAL

- 4.1 ALUMINIUM WINDOWS AND DOORS  
 THERMAL PERFORMANCE  
 R-value: 0.26 (as determined from NZBC H1/VM1 or H1/AS1)
- WIND - NON SPECIFIC DESIGN  
 Building wind zone: ref general section
- Window and door system**  
 WINDOWS AND DOORS TYPE  
 Manufacturer: TBC  
 Type/location: Double Glazed within thermal envelope
- WINDOW AND DOOR REVEALS - TIMBER  
 Timber species: Rad  
 Grade/treatment: H1.2  
 Thickness: 19mm  
 Finish: Paint Quality
- Finishes  
 ORGANIC POWDER COATING FINISH  
 Thickness: Average of 80 microns with a minimum of 50 microns  
 Colour: TBC
- 4.2 GARAGE DOORS  
 Brand/Type: Sectional, on Auto opener, provide 2 remotes.
- 4.3 THERMAL INSULATION  
 WALL INSULATION  
 Brand/Type: Pink Batts or Equivalent  
 R value/Thickness: R 2.4
- CEILING/ROOF INSULATION  
 Brand/Type: Pink Batts or Equivalent  
 R value/Thickness: R 3.2
- 4.4 GLAZING  
 WIND ZONE - NON-SPECIFIC DESIGN  
 Building wind zone: Refer general section
- Glass by type**  
 CLEAR FLOAT GLASS  
 Location: Refer elevations  
 Thickness: To comply with NZS 4223
- PVB LAMINATED GLASS  
 Location: Refer elevations  
 Thickness: To comply with NZS 4223
- TOUGHENED GLASS  
 Location: Refer elevations  
 Thickness: To comply with NZS 4223