

MCRAEWAYTM HOMES



Working Drawings

For The

LIMELIGHT - CAMPION

P. R. Bishop Builders Ltd.

JOB No. #0877

Lot: 4

D.P: 12106

48 Fernbrook Road

Oamaru

The plumbing & drainage in these plans
& specifications is approved for consent
issue

Any conditions are listed on the
building consent # 206452

Signed M. Smith Date 28/8/07

WAITAKI DISTRICT COUNCIL

These plans / specs approved
for construction BC # 206452

Any variations require prior approval

Required inspections are on an
attached list 24 hrs min notice

~~Plumbing and Drainage
work associated with this
consent approved for CCC~~

Signed

CONTENTS

Specification

Risk Matrix

Product Information

<i>Dwg 1.....</i>	<i>Site Plan</i>
<i>Dwg 2.....</i>	<i>Floor Plan</i>
<i>Dwg 3.....</i>	<i>Elevations</i>
<i>Dwg 4.....</i>	<i>Window Schedule</i>
<i>Dwg 5.....</i>	<i>Kitchen Joinery</i>
<i>Dwg 6.....</i>	<i>Foundation Layout</i>
<i>Dwg 7.....</i>	<i>Foundation Details</i>
<i>Dwg 8.....</i>	<i>Cross Section A-A</i>
<i>Dwg 9.....</i>	<i>Cross Section B-B</i>
<i>Dwg 10.....</i>	<i>Roof Details 1</i>
<i>Dwg 11.....</i>	<i>Roof Details 2</i>
<i>Dwg 12.....</i>	<i>Roof Details 3</i>
<i>Dwg 13.....</i>	<i>Cladding Details 1</i>
<i>Dwg 14.....</i>	<i>Cladding Details 2</i>
<i>Dwg 15.....</i>	<i>Cladding Details 3</i>
<i>Dwg 16.....</i>	<i>Chimney Details</i>

Bracing Calculation Sheets

Dwg 16..... Bracing Layout

Roof Truss Producer Statement

MiTek Technical Drawings:

Dwg 1..... Buildable Truss Layout

Dwg 2..... Slab Thickening

Dwg 3..... Lintel Fixing

Dwg 4..... Stud to Top Plate Fixing

Dwg 5..... Truss Fixings & Roof Bracing

SPECIFICATION

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

New 'Campion' House
(project name)

48 FERNBROOK ROAD
OAMARU
(project address)

P.R.BISHOP BUILDERS
LTD.

(owner's name)

Job number: 0877

Date: 24/7/07

1012 TABLE OF CONTENTS

1012	TABLE OF CONTENTS	2
1203	PRELIMINARIES & GENERAL (NZS 3910:2003)	3
2301	FOUNDATIONS	10
3101	CONCRETE	11
3801	CARPENTRY	14
4102T	THERMAKRAFT WRAPS, UNDERLAYS AND DPC	16
4201HW	JAMES HARDIE® WEATHERBOARD CLADDING	20
4203	BRICK VENEER CLADDING	22
4301	PROFILED METAL ROOFING	24
4502E	ELITE ALUMINIUM WINDOWS & DOORS	26
4505	GARAGE DOORS	31
4701B	BRADFORD GOLD™ INSULATION	32
5101G	GIB® PLASTERBOARD LININGS	35
5201	INTERIOR TIMBER DOORS AND WINDOWS	38
5502	JOINERY FIXTURES	40
5503	BATHROOM AND TOILET FIXTURES	41
6401	VINYL SURFACING	42
6501	CARPETING	44
6701	PAINTING AND PAPERHANGING	46
7101	HOT AND COLD WATER SYSTEM- PLUMBER TO EDIT !	48
7401	RAINWATER SYSTEMS	50
7402	SANITARY PLUMBING	52
7403	DRAINAGE	53
7701	ELECTRICAL	55

1. THE PROJECT

1.1 READ ALL SECTIONS TOGETHER

Read all sections together and read the PRELIMINARIES AND GENERAL section with all other sections.

2. DOCUMENTATION

Contract related issues

2.1 SEPARATE CONTRACTORS

Refer to NZS 3910:2003, First schedule, and clause 5.5 Separate contractors.

2.2 PRINCIPAL SUPPLY ITEMS

Refer to NZS 3910:2003 First schedule, Exceptions to Contractor's obligation to supply, and clause 5.9 Materials, labour and plant, subclause 5.9.1.

2.3 INCONSISTENCIES IN CONTRACT DOCUMENTS

Refer to NZS 3910:2003, clause 2.8 Documents prepared by the engineer or principal, subclause 2.8.4. For the method of handling ambiguities, they will be resolved as follows:

- Figured dimensions on drawings take precedence over scaled dimensions.
- Drawings to a larger scale take precedence over drawings to a smaller scale.
- Drawings showing particular parts of the contract works take precedence over drawings for more general purposes.
- The drawings and specifications take precedence over the schedule of quantities, if any.

Specification structure

2.4 SPECIFICATION STRUCTURE

The designation and numbering of individual specification sections follows the CBI (Co-ordinated Building Information) system for the co-ordination and classification of construction information. Sections are for reference and convenience only and do not profess to define subcontracts.

Read all sections together and read PRELIMINARIES AND GENERAL with all other sections.

Interpretations and definitions

2.5 INTERPRETATIONS

Required: Required by the documents, 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 engineer 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.

2.6 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.
 Principal: The person defined as "principal" in the NZS 3910:2003, First Schedule, item 15.1.2.
 Contractor: The person contracted by the principal to carry out the contract, defined as the "contractor" in NZS 3910:2003, First Schedule, item 15.1.2.
 Engineer: The person defined as "engineer" in NZS 3901:2003, First Schedule, item 6.1.2.

2.7 ABBREVIATIONS

The following abbreviations are used throughout the specification:

AAMI	American Architectural Manufacturers Association
AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
ASTM	American Society for Testing and Materials
BCA	Bitumen Contractor's Association
BRANZ	Building Research Association of New Zealand
BS	British Standard
CSA	Canadian Standards Association
CSIRO	Commonwealth Scientific and Industrial Research Organisation
HERA	Heavy Engineering Research Association
MPNZA	Master Painters New Zealand Association Inc
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
SAA	Standards Association of Australia
TNZ	Transit New Zealand

- 2.8 **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.
- 2.9 **PROPOSED SUBSTITUTIONS**
A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the engineer to be equivalent or superior to those specified. Except where a specified product is not available, the engineer is not bound to accept any substitutions.
- 2.10 **NOTIFICATION OF SUBSTITUTIONS**
Notify any proposed substitution of specified products. Notification to include but not be limited to:
- Product identification
 - Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
 - Statement of NZBC compliance, including durability
 - Manufacturer's name, address, telephone and facsimile numbers, website and email address
 - 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
- and
- Any changes required to the programme including any extension of time required
 - Allowance (time and cost) for re-design and documentation (if applicable)
 - Allowance (time and cost) for obtaining an amendment to the Building Consent (if applicable)
 - An assessment of any change in cost associated with the proposed substitution
- 2.11 **APPROVAL OF SUBSTITUTIONS**
Approval of substitutions to be in writing.
- 2.12 **MANUFACTURER'S AND SUPPLIER'S REQUIREMENTS**
Manufacturer's and supplier's requirements, instructions, specifications or details mean those issued by them for their particular material, product or component and are the latest edition.
- 2.13 **MANUFACTURER'S AND SUPPLIER'S DOCUMENTS**
Refer to individual sections for a detailed list of manufacturer's and supplier's documents relating to work on this project. Retain current copies of the documents listed, and all other relevant manufacturer's technical literature, on site. Make this information available to all personnel and ensure they are familiar with requirements for handling, storing, preparing for, fixing and finishing all products before commencing work.
- Reference documents**
- 2.14 **REFERENCED DOCUMENTS**
Throughout this specification, reference is made to various New Zealand Building Code (NZBC) acceptable solutions and verification methods for criteria and/or methods used to establish compliance with the Building Act.
- Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS, NZS/AS), Transit New Zealand specifications (TNZ) to 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, with the resolution of any variance being confirmed by the engineer in writing and then notified to the Building Consent Authority for consent prior to any work proceeding.
- 2.15 **DOCUMENTS REFERRED TO**
Documents referred to in this preliminaries and general section are:
- Building Act 2004
Health and Safety in Employment Act 1992
Smoke Free Environments Act 1990
- Building Consent Authority documentation**
- 2.16 **BUILDING CONSENT COMPLIANCE**
It is an offence under the Building Act 2004 to carry out any work not in accordance with the building consent.
- The resolution of matters concerning code compliance to be referred to the engineer for a direction in writing and then to the Building Consent Authority for consent.

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

2.17 BUILDING CONSENT

Obtain the building consent from the owner and keep them on site. Liaise with the Building Consent Authority for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

2.18 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the Building Consent Authority and the engineer. Producer statements to be in the form required by the Building Consent Authority.

Shop drawings

2.19 PREPARE SHOP DRAWINGS

Where specified in the work sections, provide shop drawings and submit for review. Make due allowance in the contract programme for the preparation, review and subsequent correction and re-review of shop drawings, prior to the time required for ordering materials and commencing fabrication.

Proposed shop drawings to be submitted to the engineer, in due time to ensure conformance with the contract programme. Allow 10 working days for review by the engineer.

2.20 SHOP DRAWINGS REVIEW

Shop drawing review indicates only that the supplied interpretation of the design concept has been reviewed without the need for further modification, other than the corrections indicated by the reviewer.

Review of shop drawings does not relieve the contractor of responsibility for the correctness of the shop drawings, site dimensions, the overall design, or for ensuring the work is performed in compliance with the contract documents. Nor does it 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.

Reviewed drawings which contain comments or notations indicating where the shop drawings are at variance with the contract documents to be modified and resubmitted to the engineer for re-review. Allow 5 working days for re-review by the engineer.

2.21 PROVIDE FINAL SHOP DRAWINGS

Provide final shop drawings, including required modifications, before proceeding with any fabrication or erection.

Guarantees

2.22 PROVIDE WARRANTIES

Refer to NZS 3910:2003 clause 11.5 for the form and method of submission of guarantees/warranties.

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

- Conform to the warranty agreement form included in this specification.
- Commence all warranties from the date of practical completion of the contract works.
- Maintain their effectiveness for the times stated.
- Deliver executed guarantees/warranties to the engineer before the engineer issues the Defects Liability Certificate.

2.23 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.

2.24 TRADE WARRANTIES

Where specific trade warranties are offered covering materials and/or execution of proprietary products or complete installations, provide all such warranties to the engineer.

As-built documentation

2.25 SERVICES AS-BUILT PLANS

Refer to NZS 3910:2003 clause 5.18 As-built drawings, operation and maintenance manuals, for the timing of submission and method of processing.

Prepare services as-built plans setting out the actual positions as constructed of all sewer, stormwater, sanitary plumbing, piped and ducted services, electrical and mechanical services. Except where specified otherwise, as-built plans may be marked up on copies of relevant project drawings.

Provide as-built information in the final form prior to the end of the period of defects liability.

Provide as-built drawings required by the building consent to the Building Consent Authority.

3. ESTABLISHMENT

3.1 STATUTORY OBLIGATIONS

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

3.2 BUILDING CONSENT AUTHORITY AND NETWORK UTILITY APPROVALS

Attend on Building Consent Authority officers, statutory and network utility inspectors, as necessary to obtain approvals (in addition to building consent approval) for and the satisfactory completion of, the works.

Temporary construction

3.3 TEMPORARY BUILDINGS

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

4. TEMPORARY WORKS AND SERVICES

4.1 WATER

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

4.2 ELECTRICITY

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

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

4.3 TELEPHONE

Provide on site temporary telephone facilities.

Scaffolding and shoring

4.4 GENERAL SCAFFOLDING

Provide as necessary general scaffolding for the efficient execution of the works. Placement, erection and structure to be by certified suppliers/erectors and approved by OSH inspectors before being used. Comply with OSH: "Approved code of practice for the safe erection and use of scaffolding."

Care and protection

4.5 PROTECT EXISTING BUILDINGS

Protect existing buildings and other designated features which are to remain in position during the execution of the works.

4.6 PROTECT WORKS AND EXISTING FEATURES

Protect parts of the work liable to damage, including adjoining public or private property, existing buildings, existing roads, footpaths, fences, site services, trees, landscaping and existing retained site features, until completion of the works. Construct a temporary fence at the outer edge of the drip line of trees to be protected. Comply with territorial authority requirements.

Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.

Make good damage to existing property and site features arising from construction activities or failure to protect.

4.7 STORAGE

Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers' requirements.

4.8 SAFEGUARD THE SITE, THE WORKS AND MATERIALS

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

4.9 MINIMISE DELAYS DUE TO WEATHER

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

5. PROJECT MANAGEMENT

Meetings

5.1 SITE MEETINGS

Meetings to normally be held: Fortnightly

The following persons to attend:

- Principal
- Contractor

- Subcontractors when needed (contractor to inform them)

5.2 MINUTES

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

Communicating and recording

5.3 RECORDS

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

Programming

5.4 CONTRACT PROGRAMME

Include the proposed sequence of all significant on-site and off-site activities including any intermediate key dates mentioned in the contract. Identify the critical path. Provide a tabulated schedule of information for each activity in order of:

- brief description
- duration in suitable time unit
- earliest start and latest finish time
- total float
- key dates for the supply of information or materials by others

Identify the dates by which particular information, material or plant need to be supplied or arranged by the engineer. Also identify any constraints which may have been imposed by the programme.

Supply copies of the programme to the following:

- engineer 1
- owner 1
- site supervisor 1

Monitor the contract programme by:

- recording progress regularly on the site chart
- informing the engineer promptly of any circumstances affecting any part of the programme structure and timing
- reviewing the programme once a month making alterations as needed and agreed to and re-issuing the required copies.

5.5 WORKING HOURS

Work on site is not restricted. Comply with territorial authority consent conditions and noise and nuisance controls.

Health and safety

5.6 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety in Employment Act 1992. Comply with all relevant New Zealand safety legislation.

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

Identify any significant hazards.

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

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

5.7 SMOKE FREE REQUIREMENTS

Do not smoke on site except in a designated location, in accordance with the Smoke Free Environments Act 1990. This location to be determined by the contractor with the approval of the engineer.

5.8 RESTRICTIONS

Do not:

- light rubbish fires on the site

6. CONSTRUCTION

Quality control and assurance

6.1 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 confirmation from the engineer and then confirm remedial action with the Building Consent Authority when building consent approval is affected.

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

6.2 DIRT AND DROPPINGS

Dirt and droppings deposited on public or private thoroughfares from vehicles servicing the site are to be removed by the contractor to the satisfaction of the appropriate authorities and the engineer.

6.3 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

6.4 CONFORM WITH THE DRAWINGS

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.

6.5 USE OF SET-OUT INSTRUMENTS

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

6.6 CHECK ALL DIMENSIONS

Check all dimensions both on drawings and site, particularly the correlation between components and work in place.

Execution

6.7 BEFORE COMMENCING

Before commencing any part of the work carefully examine the previous work on which it may depend. Report in writing to the engineer 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.

6.8 QUALITY OF EXECUTION

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

Materials

6.9 NEW PRODUCTS AND MATERIALS

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

6.10 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.

6.11 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.

6.12 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.

6.13 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.

6.14 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.

6.15 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

6.16

SPARES

Collect, protect and store safely all spare materials required under the contract. Give the principal an inventory of all spares.

Final presentation and cleaning

6.17

REMOVE TEMPORARY PROTECTION

Remove all temporary markings, coverings, labels and protective wrappings unless instructed otherwise.

6.18

REPLACE DAMAGED MATERIALS

Replace all materials or component damaged during the works to the standard of and integral with the original.

6.19

COMPLETE ALL SERVICES

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

6.20

CLEAN

Use a commercial cleaning firm to clean the whole of the interior of the building, including all appliances, equipment, fittings, surfaces and finishes to leave it without any blemish.

Clean and wash down all external surfaces to remove dirt, debris and marking. Clean all interior surfaces including cabinetwork, joinery, sanitary and hardware items. Vacuum or polish all floor finishes. Clean and polish all glass, both sides.

2301 FOUNDATIONS

1. GENERAL

Refer to 3101 CONCRETE for poured concrete footings, foundations, foundation walls and floor slabs.
Refer to 3301 CONCRETE MASONRY for concrete block foundation walls.

1.1 DOCUMENTS

Documents referred to in this section are:

NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 3605	Timber piles and poles for use in buildings
NZS 3631	New Zealand national timber grading rules

2. PRODUCTS

2.1 CONCRETE

For piles and footings, 17.5 MPa prescribed mix concrete to NZS 3104, section 3, Provisions for prescribed mix concrete, and NZS 3604, section 6.4.5, Pile footings.

3. EXECUTION

3.1 FOUNDATIONS GENERALLY

Comply with NZS 3602 and NZS 3604 except as varied by 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 EXCAVATIONS

Refer to 2201 PREPARATION AND GROUNDWORK.

3101 CONCRETE

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

AS 1366	Rigid cellular plastics for thermal insulation Part 3 Rigid cellular polystyrene – Moulded (RC/PS – M)
NZS 3101	Concrete structures standard Part 1 The design of concrete structures
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber framed buildings
AS/NZS 4671	Steel reinforcing materials

2. PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 20 MPa grade, maximum aggregate size 19 mm ready-mixed to NZS 3104. Provide delivery docket listing mix and despatch details.

2.2 SITE CONCRETE

Special concrete 10 MPa with minimum water for workability, all materials and batching to NZS 3104: table 3.1, Prescribed mixes (P).

2.3 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 to AS/NZS 4671.

2.4 TYING WIRE

Mild drawn steel wire not less than 1.2 mm 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 DAMPPROOF MEMBRANE

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

3. EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 FALSEWORK AND FORMWORK

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

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

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

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

3.3 INSTALL DAMPPROOF MEMBRANE

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

3.4 CUT AND BEND REINFORCEMENT

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

3.5 ADJUSTMENTS

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

- 3.6 TOLERANCES, BENDING
To NZS 3109: clause 3.9, Tolerances for reinforcement.
- 3.7 SECURE REINFORCEMENT
Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109: clause 3.6, Spacing of reinforcement.
- 3.8 LAPPED SPLICES
Length of laps where not dimensioned on the drawings in accordance with the 4. SELECTIONS. Increase laps of plain round steel by 100%. Provide laps only where indicated on the drawings. Tie all lapping bars to each other.
- 3.9 REINFORCEMENT COVER
Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on the drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101: table 5.5, Minimum required cover. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109: clause 3.9, Tolerances for reinforcement.
- 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 100 mm in length. Location and form of conduits to be approved in writing by the owner. Minimum cover 40 mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25 mm 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: clause 5.6, 5.6.3 Type B.
- 3.12 PRE-PLACEMENT INSPECTION
Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the territorial authority inspector.
- 3.13 SURFACE FINISHES
To NZS 3114: clause 105, Specification of finishes, as scheduled or as denoted on the drawings.
- 3.14 EXPOSED CONCRETE
Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Unless detailed, obtain written confirmation of the type and pattern of all joints.
- 3.15 CONCRETE SURFACE TOLERANCES
To NZS 3114: clause 104, Surface tolerances and clause 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.
- 3.16 PUMPING CONCRETE
Set up and supervise pump operation, placing and compaction of the mix to NZS 3109: clause 7.4, Handling and placing and clause 7.6, Compaction. Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.
- 3.17 COMPACTION
Use power operated vibrators on foundations, vertical constructions and beams.
- 3.18 RESIDENTIAL FLOOR SLABS
Construct to NZS 3604: clause 7.5, Concrete slab-on-ground floors in timber buildings. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3 mm gradual deviation over a 3 metre straight-edge, to NZS 3109: clause 104, Surface tolerances.
- 3.19 SAW CUTS
Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring. Where saw cuts are made, cut out 100 mm of every second wire of the mesh for a length of 50 mm each side of the saw cut position. Saw cuts: $\frac{1}{3}$ slab depth or 30 mm minimum.
- 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

STRIKE FORMWORK

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

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.23

CLEAN OUT

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

3.24

REMOVE

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

3801 CARPENTRY

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

AS/NZS 1748	Mechanically stress-graded timber
AS/NZS 1860	Particleboard flooring, 1860.1: Specifications
AS/NZS 2269	Plywood - Structural
AS/NZS 2918	Domestic solid fuel burning appliances - Installation
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber framed buildings
NZS 3606	Manufacturer of glue-laminated timber
NZS 3631	New Zealand national timber grading rules
NZS 3640	Chemical preservation of round and sawn timber

BRANZ Bulletin 453: Fasteners selection

BRANZ Bulletin 368: Preventing moisture problems in timber framed skillion roofs

1.2 DIMENSIONS

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

2. PRODUCTS

2.1 BUILDING WRAPS AND UNDERLAYS

Refer to WALL CLADDING and THERMAL INSULATION for the supply of wall wraps, underlays and sheet insulation products.

2.2 TIMBER FRAMING, CHEMICAL FREE, MECHANICALLY STRESS GRADED

Species, grade and moisture content in service as set out in NZS 3602. Machine stress graded to AS/NZS 1748, with an average moisture content at supply of 16% or less.

2.3 LAMINATED TIMBER

Radiata pine laminations to NZS 3606 table 1; treated as required by NZS 3602, to the requirements of NZS 3640, with special attention to Appendix B "Specification advisory notes". Supply weather resistant sealed.

2.4 TIMBER TRUSSES

Moisture content: 16% at supply

2.5 TIMBER TRUSSES, CHEMICAL FREE

Moisture content: 16% at supply

2.6 NAILS

Steel, stainless steel and galvanized steel of pattern to suit the location and to BRANZ Bulletin 453 Fasteners selection.

2.7 BOLTS AND SCREWS

Steel, stainless steel and galvanized steel of pattern to suit the location and to BRANZ Bulletin 453 Fasteners selection.

2.8 NAIL PLATES

Stainless steel and/or galvanized steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings.

2.9 CONNECTORS

Galvanized steel connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

3. EXECUTION

3.1 EXECUTION GENERALLY

To NZS 3603 and 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 6 mm; or
- a 12 mm minimum free draining air space

3.3 ATTENDANCE

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

3.4 MOISTURE CONTENT

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

Framing at erection: 24% maximum
 Framing at enclosure: 20% maximum
 Framing at lining: 16% maximum
 Timber strip flooring: 10% at time of laying

- 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 noggs, all fabricated and fastened to NZS 3604, section 8, Walls.
- 3.7 **FRAMING ROOFS**
 Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, Posts and 10, Roof framing.
- 3.8 **FRAMING CEILINGS**
 Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, Ceilings. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, Openings in ceilings. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, Water tanks in roof space.
- 3.9 **INSTALLING WALL WRAPS, UNDERLAYS AND SHEET INSULATION PRODUCTS**
 Refer to WALL CLADDING and THERMAL INSULATION for the installation of wall wraps, underlays and sheet insulation.

4. SELECTIONS

4.1 EXTERIOR WALL FRAMING

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	MSG8	CF

4.2 ROOF FRAMING

Member	Species	Grade	Treatment
Rafters:	Radiata pine	~ MSG8	H1.1
	Douglas fir	~ MSG8	None
Trusses:		~	H1.1
	Douglas fir	MSG8	None
Purlins:	Radiata pine	MERCH	H1.1
Valley boards:	Radiata pine	Merchantable	H3.1

4.3 INTERIOR FRAMING

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	MSG8	None
Structural and braced walls:	Radiata pine	~ MSG8	None

4102T THERMAKRAFT WRAPS, UNDERLAYS AND DPC

1. GENERAL

This section relates to the application of Thermakraft Industries (NZ) Ltd DPC, underfloor foil insulation, wall wraps and roofing underlays.

Documents

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC	E2/AS1 External moisture
AS 1530	Methods for fire tests on building materials, components and structures
NZS 2295	Building papers (breather/absorbent type)
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber framed buildings
NZS 4200	Pliable building membranes and underlays
AS/NZS 4347	Damp-proof courses and flashings – Methods of test
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
BRANZ	Appraisal Certificate No. 356 Thermakraft Cover-up breather-type building membrane
BRANZ	Appraisal Certificate No. 329 Thermakraft Supercourse 500 damp-proof course and concealed Flashing
BRANZ	Appraisal Certificate No. 549 Diflex 130 Building Wrap
BEAL	Appraisal C493 Thermakraft Aluband window sealing tape and Aluband corner moulded piece system
NZMRM	NZ metal roof and wall cladding – Code of practice

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

1.2 MANUFACTURER'S DOCUMENTS

Thermakraft documents relating to work in this section are:
Thermakraft product manual and technical data sheets.

Copies of the above literature are available from:

Web: www.thermakraft.co.nz
Telephone: 0800 806 595

1.3 MANUFACTURERS WARRANTY

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Industries Ltd warrant their wall wraps and roofing underlays to meet the durability of the cladding up to 50 years.

1.4 ABBREVIATIONS

The following abbreviations are used in this specification.

BEAL	Building Elements Assessment Laboratory.
NZMRM	New Zealand Metal Roofing Manufacturers Inc.
NASH	National Association of Steel Framed Buildings

1.5 INTERPRETATION

Wall underlay used in this specification has the same meaning as building wraps in NZS 3604 and NZBC E2/AS1.

Requirements

1.6 NO SUBSTITUTIONS

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

- 1.7 INSTALLATION SKILL LEVELS
Installers to be experienced in the installation of **Thermakraft** products and familiar with **Thermakraft** Industries technical literature and the NZMRM NZ metal roof and wall cladding – Code of practice.

2. PRODUCTS

Materials

DPC

2.1 EMBOSSED POLYETHYLENE

Supercourse 500 hi-impact polyethylene film to AS/NZS2904 and embossed on both sides. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings to doors and windows and complying with BRANZ Appraisal Certificate No. 329.

2.2 POLYETHYLENE BREATHER TYPE MEMBRANE

Thermakraft Cover-Up high tensile coated polyolefin woven into sheet form with micro sized pores that allow the membrane to breathe with a fire retardant flammability index of 1, tested to AS 1530. To comply with BRANZ appraisal certificate No. 356.

2.3 BITUMINOUS SELF-SUPPORTING ROOFING UNDERLAY

Thermakraft 215 bituminous self-supporting roofing underlay tested to NZS 2295. To be used direct fixed metal wall claddings.

2.4 BITUMINOUS SELF-SUPPORTING ROOFING UNDERLAY

Thermakraft 215 bituminous self-supporting roofing underlay tested to NZS 2295.

Accessories

2.5 WINDOW DOOR SEALING SYSTEM

Thermakraft Aluband system consists of aluminium faced bituminous window sealing tape, **Thermakraft Aluband** corner moulded polyethylene (PE) piece, used in conjunction with the **Thermakraft Aluband** hand tool to ensure proper adhesion and a tight fit into corners. See **Thermakraft** Data Sheet 312 for installation details and BEAL Appraisal C403.

2.6 GUTTER AND UNDER FLASHINGS

Thermakraft 215 bituminous breather type building paper cut to width by manufacturer for use under valley, apron flashing and internal gutters.

Soffit liner cut to width from **Thermakraft 210** bituminous breather type building paper. Refer to SELECTIONS.

2.7 TAPE

Thermakraft tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. **Thermakraft Aluband** tape can be use to repair damaged bituminous building papers.

3. EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To NZS 3604 Section 11 Table 11.1 Underlays; and NZBC E2/AS1 Table 23 Properties of Roof Underlays and Building Wraps; and **Thermakraft** Industries technical literature.

3.2 STORAGE

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

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

Application DPC

- 3.4 DPC TO LOSP TREATED TIMBER
Lay Supercourse 500 DPC under LOSP treated bottom plate of all timber framed walls on concrete, in a single layer with 50 mm overlaps at joints to provide a waterproof barrier.
- 3.5 DPC TO TIMBER / STEEL
Lay DPC under the bottom plate of all timber / steel framed walls on concrete, in a single layer with 50 mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type.
- 3.6 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.

Application – Wraps / wall underlay

- 3.7 WALL UNDERLAY
Fix horizontally to outside face of framing in true alignment, with succeeding sheets overlapping 150 mm. Fix to Thermakraft Industries 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.

Application - Roofing underlay

- 3.8 BUILDING PAPER ROOF UNDERLAY
Lay vertically over purlins on wire netting with a 150 mm side lap. Fix securely to purlins with galvanized fixing caps. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based papers and 7 metres for fire retardant underlays.
- Lay horizontally across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150 mm. Scribe around and fit neatly to all penetrations. Avoid prolong exposure by installing the roof immediately. Installation to comply with NZBC E2/AS1 clause 8.1.5.1.

- 3.9 GUTTER AND UNDER FLASHINGS
Lay Thermakraft 215 bituminous breather type building paper cut to width by manufacturer for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix Thermakraft 210 bituminous breather type building paper soffit liner from top plate down 150 mm past ribbon plate.

Completion

- 3.10 CLEAN UP
Clean up as the work proceeds.
- 3.11 LEAVE
Leave work to the standard required by following procedures.
- 3.12 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 DPC
Type: **Supercourse 500**

4.2 WALL WRAPS / UNDERLAYS – ABSORBENT CLADDING

Type: **Thermakraft Cover-Up** polyethylene fire retardant breather type membrane

4.3 ROOFING UNDERLAYS

Type: **Thermakraft 215** bituminous self-supporting breather type building paper

4.4 WINDOW/DOOR SEALING SYSTEM

Type: **Thermakraft Aluband** Window Sealing System (comprising of Aluband Corner Moulded Piece and Aluband Window Sealing Tape).

4201HW JAMES HARDIE® WEATHERBOARD CLADDING

1. GENERAL

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E2/AS1	External moisture, 9.0 Wall claddings
NZBC E2/VM1	Weathertightness
AS/NZS 1170	Structural design actions, Part 2: Wind actions
AS/NZS 2908	Cellulose-cement products, 2908.2 Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 4203	General structural design and design loadings for buildings

1.2 MANUFACTURER'S DOCUMENTS

Linea® weatherboard technical specification January 2005

BRANZ Appraisal certificate No. 446 (2005) Linea® weatherboard

BRANZ Appraisal certificate No. 447 (2005) Linea® weatherboard cavity construction

Copies of the above literature are available at www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

The BRANZ appraisal is available at www.branz.co.nz.

Performance

1.3 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by James Hardie® technical specification and the wind loads on various wall areas as given by NZS 4203 or AS/NZS 1170.

2. PRODUCTS

Materials

2.1 BUILDING WRAP

Waterproof, breather type to NZBC E2/AS1, Table 23: Properties of roof underlays and building wraps.

2.2 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 45 mm wide x 18 mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, table 1, reference TD.10.

2.3 EXTERIOR CAVITY VERMIN-PROOFING

Perforated uPVC with upstands.

2.4 LINEA® WEATHERBOARDS

James Hardie® Linea® weatherboards, 16 mm 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.

2.5 SOFFIT LINING

James Hardie® 4.5 mm Hardisoffit® Lining, Hardiflex® Eaves Lining, Silkline® Soffit Lining Eclipsa™ Eaves Lining and 6mm Hardiflex® Lining soffit manufactured from treated cellulose fibre, Portland cement, sand and water and cured by high pressure autoclaving manufactured to AS/NZS 2908.2.

Components

2.6 FASTENER TYPE

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

Exposure conditions & nail selection prescribed by NZS 3604, section 4, table 4.3 Steel items such as nails and screws used for framing and cladding.

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

2.7 SCREWS

40 mm x 9 gauge stainless steel fascia screws

30 mm x 7 gauge stainless steel HardiDrive screws

2.8 GALVANIZED NAILS

60 mm x 3.15 mm diameter jolt head

75 mm x 3.15 mm diameter jolt head

Hardiflex® 40 mm x 2.8 mm diameter

Hardiflex® 60 mm x 3.15 mm diameter, 6.8 mm minimum head diameter

Hardiflex® 75 mm x 3.15 mm diameter, 6.8 mm minimum head diameter

2.9 SOFFIT JOINTERS AND CAPPING MOULDS

Extruded PVC jointer, 2 way jointer, capping and scotia mould.

Accessories

- 2.10 SEALANT
Fosroc MS sealant or similar. Refer to James Hardie® technical specifications for application requirements.

3. EXECUTION

Conditions

- 3.1 STORAGE
Take delivery of weatherboards dry and undamaged in pallets and lay horizontally on a smooth level surface. 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 in vertical position. Do not drag weatherboards across each other, or across other materials. Protect edges, corner and surface finish from damage.
- 3.3 SUBSTRATE
Do not commence work until the substrate is of the standard required 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 FIX BUILDING WRAP
Run and fix building wrap in full height rolls to wall framing, with fixing and end laps to NZS 3604 and the wrap manufacturer's requirements and with the wrap not damaged in any way.
- 3.5 INSTALL DRAINED CAVITY
18 mm minimum thickness drained cavity 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 building wrap. Seal the top of the cavity and install vermin-proofing at base. Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.
- 3.6 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:
- Building wrap appropriately incorporated with penetration and junction flashings.
 - Materials lapped in a way that water tracks down to the exterior face of the building wrap.
 - Wall cladding under building wrap 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).
- 3.7 INSTALL LINEA® WEATHERBOARDS
Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Fit internal corners and weatherboards as per Linea® weatherboard technical specifications. Fit and fix external corners and joint soakers as required.
- 3.8 INSTALL FLASHINGS
Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to NZBC E2/AS1
- 3.9 INSTALL SOFFIT SHEETS
Cut sheets dry and scribe fit to fully support all edges and joints. Nail and insert PVC fasteners to James Hardie® requirements. Fit complete with colour matched jointers and capping moulds. Refer to James Hardie® technical specifications.

Completion

- 3.10 REPLACE
Replace all damaged or marked elements.
- 3.11 LEAVE
Leave work to the standard required for following procedures.
- 3.12 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

- 4.1 CAVITY BATTENS
Timber species: Radiata pine
Treatment: H3.2

Linea® weatherboards

- 4.2 LINEA® WEATHERBOARDS
Brand/type: James Hardie® 135 Linea® weatherboard

4203 BRICK VENEER CLADDING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC B1/AS1	Structure general, 2.0 Masonry
NZBC B1/AS3	Small chimneys
AS/NZS 2699	Built in components for masonry construction
	2699.1 Wall ties
	2699.3 Lintels and shelf angles (durability requirements)
AS/NZS 2918	Domestic solid fuel burning appliances - Installation
NZS 3103	Sands for mortars and plasters
NZS 3117	Specification for pigments for Portland cement and Portland cement products
NZS 3604	Timber framed buildings
NZS 4210	Masonry construction: Materials and workmanship
AS/NZS 4455	Masonry units and segmental pavers

BRANZ Bulletin 436: Masonry veneer construction

1.2 QUALIFICATIONS

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

2. PRODUCTS

2.1 BRICKS

To AS/NZS 4455.

2.2 LINTELS

To AS/NZS 2699.3, and as detailed.

2.3 VERMIN STOP

Galvanized steel wire netting strip with reinforced edges and galvanized staples for fixing.

2.4 DAMPPROOF MEMBRANE

Heavy kraft strip laminates saturated and coated with bitumen, or bituminous brush-applied liquid membrane to suit location and detail.

2.5 VENEER TIES

To AS/NZS 2669.1, as modified by NZBC B1/AS1.

2.6 SAND FOR MORTAR

Sand to comply with NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.

2.7 MORTAR

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210, clause 2.2. Obtain written approval of admixture to be used. Also obtain written approval if intending to use cement mortar as a damp proof course and where, or if intending to use hydrated lime in the mortar.

2.8 MORTAR COLOUR

Add mineral oxide pigment conforming to NZS 3117 and to requirements of NZS 4210, clause 2.2.2.2(f).

2.9 WATER

Clean, fresh and free from excess alkali, salt, silt and organic materials. Water from a local authority water supply is acceptable.

3. EXECUTION

3.1 VENEER WORK

To NZS 3604, section 11.7, NZS 4210, section 2.9 and BRANZ Bulletin 436.

3.2 DETAILING

Where not otherwise detailed on the drawings or covered in the documents listed, carry out veneer construction to the details required by BRANZ Bulletin 436.

3.3 STORAGE

Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.

3.4 LAY BRICKS

To NZS 4210. Ensure bricks are dry when laid. Use bricks equally off all pallets as work proceeds. Distribute facing bricks of varying colour randomly throughout so no patches or striping appears.

3.5 BOND

Stretcher bond, single width unless detailed or stated otherwise.

- 3.6 **INSTALLING VENEER WALL TIES**
Fix to face of studs without otherwise piercing or damaging the building paper. Ties placed and spaced to NZS 4210, section 2.9.7, as modified by NZBC B1/AS1. Install to NZS 3604, clause 11.7.5.3.
- 3.7 **MORTAR**
To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1½ hours of mixing.
Joint thickness: 10 mm ± 1 mm.
- 3.8 **RAKE OUT**
Rake out joints as work proceeds, for pointing as detailed. Maximum depth of rake.
- 3.9 **POINTING**
Joints tooled concave after initial stiffening.
- 3.10 **WEEPHOLES**
Weep holes to NZS 3604, clause 11.7.4.3 and to BRANZ Bulletin 436.
- 3.11 **CO-ORDINATE**
Co-ordinate the building-in of all exterior joinery and items required to be fitted as the work proceeds. Rake out for or build in flashings as required.
- 3.12 **KEEP CAVITY AND TIES CLEAR**
Keep cavity and ties clear of mortar droppings and clean the brickwork face of any marking as the work proceeds. Repair damage to building paper immediately it occurs.
- 3.13 **LIQUID DAMPPROOFING**
Apply bituminous brush-on liquid applied membrane as a primer and 2 coats, to drain water effectively out of the cavity.
- 3.14 **DAMP PROOF MEMBRANE**
Lay the bitumen laminate sheet, lapped and adhered, to drain water effectively out of the cavity.
- 3.15 **SOLID FUEL BURNING APPLIANCE INSTALLATION**
Carry out the brick linings and hearths to the requirements of NZS 7421, as detailed and to the appliance manufacturer's requirements.
- 3.16 **FIREPLACE CONSTRUCTION**
Foundations, firebox and chimney to NZBC B1/AS3.
- 3.17 **CLEAN DOWN**
Clean down brickwork to remove stains. Remove efflorescence with a stiff bristle broom, blot with a damp sponge and wash walls with a plentiful supply of clean water during fine weather.
- 3.18 **TAKE AWAY**
Remove from the site materials not used.
4. **SELECTIONS**
- 4.1 **BRICKS**
Brand/type: FIRTH DEVONSTONE 70 SERIES

4301 PROFILED METAL ROOFING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC E2/AS1	External moisture
	4.0 Flashings
	5.0 Roof/wall junctions
	8.0 Roof claddings
	8.1 General
	8.4 Profiled metal

AS 1397	Steel sheet and strip - hot-dipped, zinc-coated, or aluminium/zinc-coated
NZS 3403	Specification for hot-dipped galvanized corrugated steel sheet for building purposes
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire

NZ Metal Roofing Manufacturers Inc: NZ metal roofing & wall cladding code of practice

1.2 QUALIFICATIONS

Carry out roofing work using experienced, competent roofers familiar with the materials and techniques specified.

1.3 WIND AND EARTHQUAKE LOADINGS

Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604, section 5.

1.4 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.

1.5 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.

2. PRODUCTS

2.1 PROFILED METAL ROOFING

Steel sheet galvanized to NZS 3403, aluminium/zinc coated to AS 1397. Finish as specified. Accessories, cappings, flashings and fixings to match and to the roofing manufacturer's requirements.

2.2 UNDERLAY

Breather type, water proof.

2.3 NAILS, SCREWS AND FASTENINGS

Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability.

3. EXECUTION

3.1 STORAGE

Stack roofing and accessories on clean, level areas of the site and protect from damage and from weather until ready to fix in place. Avoid overloading roof structure when roofing materials are placed on the roof area prior to installation.

3.2 LAY ROOF UNDERLAY

Lay and fix to NZBC E2/AS1: 8.1.5 Underlays, NZS 3604, section 11.2.2 and the roofing manufacturer's requirements.

3.3 LAY ROOFING, GENERALLY

Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface.

3.4 CUT PROFILED METAL ROOFING

Cut profiled metal roofing only with tools recommended by the roofing manufacturer. Fold ends and seal cut edges to the roofing manufacturer's requirements.

3.5 INSTALL PROFILED METAL ROOFING

Install profiled metal roofing and fix complete with all matching accessories, flashed to all roof features and penetrations; and in accordance with the requirements in the NZ Metal Roofing Manufacturers Inc: NZ metal roofing and wall cladding code of practice.

3.6 FIXINGS

Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements.

- 3.7 **INSTALL COVERS AND FLASHINGS**
Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC E2/AS1: 4.0 Flashings, 5.0 Roof/wall junctions and 6.0 Parapets.
- 3.8 **PENETRATIONS**
Flash and overflash all penetrations through the roof.
- 3.9 **PENETRATIONS AND JUNCTIONS**
Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:
- underlay turned up at wall and parapet lines
 - underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
 - roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
 - installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).
- 3.10 **USE OF SEALANTS**
Select and use sealants only as recommended by the roofing manufacturer.
- 3.11 **COMPLETE**
Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.
- 3.12 **REMOVE FILINGS**
Remove metal filings from roofing surfaces at least daily.
- 3.13 **CLEAR**
Clear trade rubbish and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes, ensuring that metal filings, metal scraps and loose fixings are removed.
- 3.14 **REPLACE**
Replace damaged or marked elements. Remove unused materials from the site.
4. **SELECTIONS**
Longrun corrugated 'Colorsteel'

4502E ELITE ALUMINIUM WINDOWS & DOORS

1. GENERAL

Related work

1.1 RELATED SECTIONS

Refer GLAZING specification work section for glass type and thickness.
Refer HARDWARE specification work section for hardware type.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 1170	Structural design actions, Part 5: Earthquake actions - New Zealand
AS/NZS 1170	Structural design actions, Part 2: Wind actions
AS 1449	Wrought alloy steels - stainless and heat resisting steel plate, sheet and strip
AS 1734	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3504	Aluminium windows
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
NZS 4203	General structural design and design loadings for buildings
NZS 4211	Performance of windows
NZS 4223	Glazing in buildings, Part 3: Human impact safety requirements
AS/NZS 4680	Hot-dip galvanised (zinc) coatings on fabricated ferrous articles
BS 3900	Methods of tests for paints - Part C5: Determination of film thickness
AAMA 2604	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
US Federal Specification TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)
WANZ	Specification for powder coatings on architectural aluminium products
WANZ (WIS)	Window Installation System: An Alternative Solution for the installation of windows and doors
WANZ	Anodic oxide coatings on wrought aluminium for external architectural applications (WANZ SFA 3503-03:2005)
WANZ	Aluminium Window Handbook

1.3 MANUFACTURER'S DOCUMENTS

Aluminium Systems documents relating to work in this section are:

Elite Windows and Doors: Architectural Manual
Elite Windows and Doors: Feel the difference technology can make pamphlet
Aluminium Systems: WANZ (WIS) Window Installation System

Copies of the above literature are available from Aluminium Systems

Email: marketing@aslnz.co.nz

Web: www.aslnz.co.nz

Telephone: 0-9-574 2900

Facsimile: 0-9-574 2901

Further information and/or names of approved fabricators are available by phoning 0800 111 484.

Requirements

1.4 QUALIFICATIONS

Carry out fixing by the manufacturer or by a firm nominated and approved by the window manufacturer in writing.

1.5 DESIGN OF SASHES

Hollow box section extrusions joined with staking angles at corners.

1.6 SASH DESIGN

Open section extrusions jointed by screw traces at corners.

1.7 GLAZING DESIGN

Ensure glass is capable of being reglazed without dismantling sashes.

1.8 BEAD DESIGN

All glazing beads internal.

- 1.9 **SHOP DRAWINGS AND INSTALLATION DETAILS**
 Shop drawings to show, but not be limited to:
 Design calculations
 Construction details (minimum scale 1:10) showing the interface between joinery elements and the building structure including: -
 - Interaction between claddings and linings
 - Flashing details
 - Sealants and air seals
 - Rebate sizes
 - Non standard fixing details including bracketing
 Dimensions of all typical elements and of any special sizes and shapes
 Provision for the exclusion and/or drainage of moisture
 Jointing details and method of fixing between individual elements and between the installation and adjacent work
 Provision for adjustment of fixings to ensure true alignment of windows and doors
 Sealant types and full size sections of all sealants and backing rods
 Provision for thermal movement
 Provision for seismic movement and movement under wind loads
 Sequence of installation
 Full details of typical glazing gaskets and glazing wedges
 Glazing specification and details
- Refer to PRELIMINARIES & GENERAL specification section for requirements for submission and review and the provision of final shop drawings.
- Complete shop drawing review at least 4 weeks before commencing fabrication.
- 1.10 **REVISED SHOP DRAWINGS**
 Provide a copy of shop drawings revised to include required modifications, before proceeding with any fabrication or erection.
- 1.11 **MAINTENANCE PROGRAMMES**
 Provide a maintenance programme in written and graphic form upon completion of the aluminium window and door installation.
- Warranties**
- 1.12 **WARRANTY**
 Warrant this work under normal environmental and use conditions against failure of materials and execution.
 Warranty period: 2 years
- Performance**
- 1.13 **RESPONSIBILITY FOR PERFORMANCE**
 Accept responsibility for the structural and weather-tight performance of the completed window and door installation, the glazing work and all spandrel and infill panel work.
- 1.14 **CERTIFY COATINGS**
 Certify on request compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) for certifying thickness and method (a) where any dispute arises as to the thickness provided.
- 1.15 **CERTIFICATION**
 Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of NZS 4211 and the specified design wind pressure and air leakage level.
- 1.16 **IN SITU TOUCH-UP**
 In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted after receiving written authority. Replace all damaged material.
- 2. PRODUCTS**
- Materials**
- 2.1 **WINDOWS**
- 2.2 **DOORS**
- 2.3 **ALUMINIUM EXTRUSIONS**
 Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.
- 2.4 **ALUMINIUM SHEET AND STRIP**
 Complying with AS 1734 of suitable thickness. Rolled for anodising or powder coating.
 Alloy designation: 5251 - H16 or 5005 - H16.
- 2.5 **FLASHINGS GENERALLY**
 Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

- 2.6 **WANZ CAVITY CLOSER**
Flashing device to close the cavity above the window or door unit to direct water that occasionally penetrates the wall cladding into the cavity spaces adjacent to the window.
- 2.7 **WANZ SUPPORT BAR**
Extruded aluminium support bar with built in drainage and ventilation to NZBC E2, to provide continuous support to the window unit.

Components

- 2.8 **HARDWARE AND FURNITURE**
Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for brand, type and finish. Key alike all lockable window hardware able to be keyed alike.
- 2.9 **SAFETY STAYS**
Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Table 2, Acceptable opening sizes for barriers.

Accessories

- 2.10 **POINTING SEALANT**
Building sealant or approved equivalent with not less than a + 40% movement factor complying with US Federal Specification TT-S-001543A.
- 2.11 **STRUCTURAL SEALANT**
Provide in structural sealant joints for movement of ~

Follow recommendations of the structural sealant manufacturer. Use in conjunction with compatible silicone rubber spacers and gaskets or double-sided expanded cellular glazing tapes.
- 2.12 **WEATHERING SEALANT**
Building sealant used in accordance with manufacturer's instructions for weather sealing glass to glass joints complying with US Federal Specification TT-S-0011534A, or a one-part polyurethane medium modulus ($\pm 25\%$ movement) to US Federal Specification TT-S-00230C.

Finishes

- 2.13 **EXTERNAL ORGANIC COATED ALUMINIUM**
Polyester powder organic coating in accordance with WANZ Specification for powder coatings in architectural aluminium products and AS 3715.

3. EXECUTION

Conditions - generally

- 3.1 **DELIVERY**
Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.
- 3.2 **UNLOAD**
Unload, handle and store elements in accordance with the window manufacturer's requirements.
- 3.3 **AVOID**
Avoid distortion of elements during transit, storage and handling.
- 3.4 **PREVENT**
Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.
- 3.5 **PROTECTION**
Retain protective coverings and coatings in place during and after installation.
- 3.6 **ADDITIONAL PROTECTION**
Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

Conditions - fixings and fastenings

- 3.7 **SUPPLY OF FIXINGS**
Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the design wind pressure stated in the STANDARD OF PERFORMANCE clause.
- 3.8 **EXPOSED FIXINGS AND FASTENINGS**
Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel.
- 3.9 **PROTECTED FIXINGS AND FASTENINGS**
Fixings and fastenings not exposed to the weather may be hot dipped galvanised steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

- 3.10 **TIMBER LINERS**
Before fixing to aluminium frames, ensure that timber liners which are being painted have been primed on all surfaces.
- Assembly**
- 3.11 **FABRICATION**
Fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.
- 3.12 **HARDWARE GENERALLY**
Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.
- 3.13 **SAFETY STAYS**
Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.
- Application**
- 3.14 **CORROSION PROTECTION**
Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.
- 3.15 **CONFIRM PREPARATION OF WALL OPENINGS**
Confirm that wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.
- Required preparatory work includes the following:
- wall cladding underlay/building wrap to openings finished and dressed off with sill tapes ready for the installation of window and door frames
 - claddings neatly finished off to all sides of openings
 - interior linings neatly trimmed ready for installation of jamb liners and completion of air seals to all sides of openings
 - installation of flashings (those which are required to be installed prior to frames).
- 3.16 **INSTALLATION GENERALLY**
Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.
- 3.17 **INSTALLATION CAVITY CONSTRUCTION**
Install to Wanz Installation System details and drawings including Wanz cavity closers, support bars and support angles.
- 3.18 **INSTALL FLASHINGS**
Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.
- Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.
- Except where window/door frames are recessed, ensure that head flashings over-sail jamb facings by 15 mm at each end.
- 3.19 **COMPLETE AIR SEAL**
Form an air-tight seal by means of proprietary low expanding foam or compressible foam strips, applied deep within the reveal to completely seal the gap between joinery and structural framing while ensuring the trip cavity is not completely filled. Ensure that in combination with the internal linings a complete air seal is created.
- 3.20 **FIX HARDWARE**
Fix all sash and door hardware and furniture as scheduled.
- Application - jointing and sealing**
- 3.21 **SEAL FRAMES ON SITE**
Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.
- 3.22 **PREPARE**
Ensure joints are dry. Remove loose material, dust and grease.
- 3.23 **PREPARE JOINTS**
Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary.
- 3.24 **PREPARATION**
Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

- 3.25 **BACKING**
Insert polyethylene rod or tape back-up behind joints being pointed with sealant.
- 3.26 **BACK UP**
When using back-up material do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant.
- 3.27 **POINTING, BEAD**
Tool sealant to form a smooth, flat bead.
- 3.28 **POINTING, FILLET**
Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer.
- 3.29 **FINISHING**
Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.
- Completion - cleaning**
- 3.30 **REMOVE TRADE DEBRIS**
Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.
- 3.31 **CLEANING GENERALLY**
Clean with soft, clean cloths and clean water. Finish with a clean squeegee. Do not use abrasive or alkaline materials.
- 3.32 **TRADE CLEAN**
Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.
- 3.33 **SAFETY**
Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.
- 3.34 **MANIFESTATIONS**
To NZS 4223, part 3, 303.1. Manifestation (making glass visible).
- Completion**
- 3.35 **PROTECTION**
Protect finishes against damage from adjacent and following work.
- 3.36 **REPLACE**
Replace damaged, cracked or marked elements.
- 3.37 **LEAVE**
Leave work to the standard required for following procedures.
- 3.38 **REMOVE**
Remove safety indicators and protective coverings, and wipe down all joinery thoroughly to leave it perfectly clean. Remove debris, unused materials and elements from the site.

4505 GARAGE DOORS

1. GENERAL

Related work

1.1 RELATED SECTIONS

Refer to 4601 GLAZING for glazing not forming part of the proprietary garage door.
Refer to 6701 PAINTING AND PAPERHANGING for painting not forming part of the proprietary garage door.
Refer to 7701 ELECTRICAL for power supply to opening system

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 1170	Structural design actions
NZS 1170	Structural design actions, Part 5: Earthquake actions - New Zealand
NZS 3604	Timber framed buildings
AS/NZS 4505	Domestic garage doors

Performance

1.3 LOADS

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind and seismic load performance requirements to NZS 3604, table 5.1, AS/NZS 1170 and NZS 1170

1.4 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weather-tight performance of the completed garage door installation.

2. PRODUCTS

2.1 GARAGE DOOR

Manufactured to AS/NZS 4505 complete with a compliance label stating manufacturer, serial number, wind and seismic classification and testing/certification details

3. EXECUTION

3.1 PREPARATION FOR INSTALLATION

Check that the trimmed and fixed openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed.

3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weather-tight fit round the entire perimeter.

3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

3.6 OPERATING INSTRUCTIONS AND MAINTENANCE PROCEDURES

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

Completion

3.7 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

3.8 REPLACE

Replace damaged, cracked or marked elements.

3.9 LEAVE

Leave work to the standard required by following procedures.

3.10 REMOVE

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

4. SELECTIONS

Futura (Horizontal woodgrain)

4701B BRADFORD GOLD™ INSULATION

1. GENERAL

This section deals with **Bradford Gold™** insulation materials installed, laid, hung or fitted as thermal and acoustic insulation.

Related work

1.1 RELATED SECTIONS

Refer to THERMAKRAFT WRAPS, UNDERLAYS AND DPC for building wraps and roofing underlays.

Documents

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC G6/VM1	Airborne and impact sound
NZBC H1/AS1	Energy efficiency, 2.0 Building thermal envelope
NZS 4218	Energy efficiency – Small building envelope
NZS 4246	Energy efficiency – Installing insulation in residential buildings
ISO 140	Acoustics Part 4: Field measurements of airborne sound insulation between rooms
NZCEP 54	Code of practice for electrical installations of recessed luminaires and auxiliary equipment

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

1.3 MANUFACTURER'S DOCUMENTS

CSR Bradford Insulation documents relating to work in this section are:

CSR Bradford Insulation product manual

Data sheets	Bradford Glasswool Building Insulation Blanket
Data sheets	Bradford Glasswool Anticon™ Roofing Blanket
Data sheets	Bradford Gold™ Ceiling
Data sheets	Bradford Gold™ Wall

Copies of the above literature are available from:

Web:	www.thermakraft.co.nz
Email:	sales@thermakraft.co.nz
Telephone:	0800 806 595
Facsimile:	0 9 273 3726

1.4 ABBREVIATIONS

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

BIB	building insulation blanket
IIC	impact insulation class

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Bradford Gold™** and **Bradford SoundScreen™** system, or associated components and products.

1.6 QUALIFICATIONS

Work to be carried out by tradesmen experienced, competent and familiar with the **Bradford Gold™** and **Bradford SoundScreen™** materials and techniques specified.

- 1.7 REFERENCES
Reference is made to the NZBC, the Building Act 2004, New Zealand Standards, overseas Standards, Acts, regulations, various industry codes of practice and practice guides.

- 1.8 DEFINITIONS
The following definitions are used throughout this part of the specification:
Segments term used for pieces of insulation

- 1.9 COMPLIANCE SCHEDULES
Provide details of inspections, maintenance and reporting procedures required to demonstrate ongoing compliance with the NZBC.

Warranties

- 1.10 MANUFACTURERS WARRANTY
Warrant this part of the work under normal environmental and use conditions against failure of materials and execution.

Form of warranty: **Bradford** Home Insulation and Installation Guarantee Certificate

Performance

2. PRODUCTS

Materials

- 2.1 GLASSWOOL THERMAL INSULATION
Bradford Gold™ blanket or segments – bio-soluble glasswool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form a rectangular insulating segment or roll. Refer to SELECTIONS for type, R value and thickness.

3. EXECUTION

Conditions

- 3.1 STORAGE
Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and damage to edges of sheet materials. Do not use damaged or wet insulation material.

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

- 3.3 INSPECTION
Before commencing installation, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, building papers and vapour barriers are in place.

Application - generally

- 3.4 CHECK WALL WRAPS AND ROOF UNDERLAYS
Ensure these are dry, clean, undamaged and free of debris before being covered.
- 3.5 CHECK VAPOUR BARRIERS
Ensure these form one homogeneous sheet vapour barrier and remain as such throughout the ensuing construction process.
- 3.6 INSTALL INSULATION GENERALLY
Lay, install, fit and fix to NZBC H1/AS1: 2.0 Building thermal envelope and to **Bradford** requirements. Install in housing to NZS 4218, NZS 4243.

Application - Bradford Gold™ insulation

3.7 FIT GLASSWOOL THERMAL INSULATING SEGMENTS

Friction fit **Bradford Gold™** insulating segments in place. Carefully scribe cut insulating segments slightly oversize to maintain friction fit to each other, to smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Do not cover vents and leave a 150 mm gap around recessed light fittings and metal flues.

Completion

3.8 CLEAN UP

Clean up as the work proceeds, so no spare off cuts or any other matter or item remain behind claddings or linings.

3.9 LEAVE

Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

5101G GIB® PLASTERBOARD LININGS

1. GENERAL

Related work

1.1 RELATED SECTIONS

Refer to GIB ULTRALINE® PLUS LINING SYSTEM for GIB Ultraline® PLUS plasterboard linings.

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
AS/NZS 2753	Adhesives-Mastic - For bonding gypsum plaster linings to wood or metal framing members
NZS 3604	Timber framed buildings

BRANZ technical paper P21: A wall bracing test and evaluation procedure

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

1.3 ABBREVIATIONS

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

FRR	Fire resistance rating
IIC	Impact insulation class
NRC	Noise reduction co-efficient
STC	Sound transmission class

1.4 MANUFACTURER'S DOCUMENTS

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

General:	GIB® Site Guide (May 2006)
Wet areas:	GIB Aqualine® Wet Area Systems (October 2002 v2)
Bracing:	GIB® Bracing Systems (March 2006)
Ceilings:	GIB® Rondo® Metal Ceiling Batten Systems
Accessories:	GIB® Cove® GIB® Goldline™ Tape-on Trims

Copies of the above literature are available at

Web: www.gib.co.nz
Telephone: 0800 100 442

Requirements

1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS

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

- National Certificate of Interior Systems; or
- Contractor membership of the Association of Wall and Ceiling Industries New Zealand (AWCINZ)

1.6 NO SUBSTITUTIONS

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

Performance

1.7 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
 - before applying finish coatings or decorative papers,
- so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

1.8 BRACING REQUIREMENTS

Provide braced wall systems using bracing rated plasterboard sheet to meet the requirements of NZS 3604 when tested to BRANZ technical Paper P21: A wall bracing test and evaluation procedure. Refer to drawings for location and type.

2. PRODUCTS

Materials

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

GIB® Standard plasterboard
GIB Aqualine® wet area plasterboard

- 2.2 CORNICE
GIB-Cove® plasterboard cornice. Refer to SELECTIONS for profile and size.

Components

- 2.3 CEILING BATTENS
GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

- 2.4 SCREWS
GIB® Grabber® drywall screws.

- 2.5 METAL ANGLE TRIMS
GIB® galvanised steel slim angle trims.

- 2.6 CONTROL JOINTS
GIB® Rondo® P35 control joints.

- 2.7 TAPE ON TRIMS AND EDGES
GIB® Goldline™ tape-on paper tape and galvanised steel trims and edges or GIB® UltraFlex high impact corner mould.

Accessories

- 2.8 ADHESIVE
Timber frame: GIBFix® Wood Bond wallboard adhesive.

- 2.9 JOINTING COMPOUND
Bedding compound: GIB Tradeset®, GIB Lite, Blue®, GIB Promix® All Purpose, GIB® AquaMix, GIB Plus 4®
Finishing compound: GIB Promix® All Purpose, GIB ProMix® Lite, GIB® All Purpose and GIB Plus 4®, GIB® Topcoat
Cove: GIB-Cove® Bond

- 2.10 JOINTING TAPE
GIB® paper jointing tape.

- 2.11 ACOUSTIC SEALANT
GIB Soundseal® acoustic sealant.

Finishes

3. EXECUTION

Conditions

- 3.1 STORAGE
Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (May 2006).

- 3.2 LEVELS OF PLASTERBOARD FINISH
Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589. Refer to GIB® Site Guide (May 2006).

- 3.3 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE
Before commencing work, agree in writing upon the surface finish assessment procedure necessary to ensure that the levels of finish specified, along with the effect of the type and/or angle of illumination on them, are obtained and are acceptable.

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

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard prior to the application of a range of decorative finishes under various lighting conditions. Refer to GIB® Site Guide (May 2006).

- 3.4 SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (May 2006).

- 3.5 TIMBER FRAME MOISTURE CONTENT
Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to GIB® Site Guide (May 2006).

- 3.6 **PROTECTION**
Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (May 2006).
- Application**
- 3.7 **INSTALL CEILING BATTENS**
Install to GIB® Rondo™ Ceiling Batten Systems.
- 3.8 **LINING WALLS AND CEILINGS GENERALLY**
Form to GIB® Site Guide (May 2006). Ensure bulk insulation thickness shall not exceed that of the wall framing.
- 3.9 **FORM WET AREA SYSTEMS**
Form to GIB Aqualine® Wet Area Systems (October 2002 v2).
- 3.10 **FORM BRACING SYSTEMS**
Form to GIB® Bracing Systems (March 2006).
- 3.11 **FORM CONTROL JOINTS**
Form control joints to GIB Ultraline® PLUS Lining System book (February 2006) and GIB® Site Guide (May 2006).
- 3.12 **INSTALL COVES**
Install to GIB-Cove® literature using GIB-Cove® Bond.
- 3.13 **INSTALL TAPE-ON TRIMS**
Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

- 3.14 **FINISHING GENERALLY**
To GIB® Site Guide (May 2006) and AS/NZS 2589.

Completion

- 3.15 **REPLACE**
Replace damaged sheets or elements.
- 3.16 **CLEAN DOWN**
Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean.
- 3.17 **REMOVE**
Remove debris, unused materials and elements from the site.
- 3.18 **LEAVE**
Leave work to the standard required by following procedures.

4. SELECTIONS

Plasterboard

4.1 STANDARD SYSTEMS WALLS

<u>Location</u>	<u>Plasterboard type / Lining requirements</u>	<u>Thickness</u>	<u>Finish level</u>
Bathrooms	GIB® Standard plasterboard GIB Aqualine® plasterboard	10 mm 10 mm	

4.2 STANDARD SYSTEMS CEILINGS

<u>Location</u>	<u>Plasterboard type / Lining requirements</u>	<u>Thickness</u>	<u>Finish level</u>
~	GIB® Standard plasterboard	13 mm	
~	GIB Aqualine® plasterboard	13 mm	

4.3 BRACING SYSTEMS

Refer to GIB Bracing Systems (March 2006). For bracing element location refer to drawn documentation.

5201 INTERIOR TIMBER DOORS AND WINDOWS

1. GENERAL

1.1 RELATED SECTIONS

Refer to 4601 GLAZING for glazing

1.2 DOCUMENTS

Documents referred to in this section are:

NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 3610	Profiles of mouldings and joinery

2. PRODUCTS

2.1 TIMBER

To NZS 3602.

2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to NZS 3610. Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

2.3 INTERIOR DOORS, TIMBER VENEER

Solid/hollow core doors as scheduled complete with matching 6 mm clashing strip to both sides and to the exposed edge of cavity slider doors.

2.4 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

3. EXECUTION

3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10 mm unless otherwise required.

3.2 EXECUTION GENERAL

Manufacture to the methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -
- Hinges

3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

Internal doors

3.5 INTERNAL JOINERY FRAMES

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

3.6 INTERNAL DOOR FRAMES, SOLID REBATED

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.7 INTERNAL DOOR LINERS

Heads and jambs finished minimum 18 mm, with 10 mm planted door stops. Width to match width of lined walls. Hang doors on hinges, sliding, or sliding-folding gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

3.8 INTERNAL DOOR LINERS, EXTENDED

Heads and jambs finished 30 mm, rebated for wall linings and extended a minimum of 10 mm. 10 mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

Completion

3.9 CHECK

Check and adjust operation of all sashes, doors, hardware and furniture.

3.10 TEMPORARY PROTECTION

On completion remove any temporary protection and leave ready for following work.

McRaeWay Homes

5502 JOINERY FIXTURES

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC D1/AS1	Access routes, 4.0 Stairways
AS/NZS 1859	Reconstituted wood based panels, 1859.2: Dry processed fibreboard
AS/NZS 1860	Particleboard flooring, 1860.1: Specifications
NZS 3602	Timber and wood-based products for use in building

2. EXECUTION

2.1 JOINERY FIXTURES GENERALLY

Execution to include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Take responsibility for the completed joinery fixtures including fittings included within fixtures and the on site installation.

2.2 SITE MEASURE

Site check and confirm dimensions after wall linings have been fixed. Verify positions of electric power outlets, wiring to light fittings included in joinery fixtures, water supplies and waste pipe locations.

2.3 FABRICATION QUALITY

Carry out machining within the practices required for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's requirements. Ensure work is accurate, square and true to line and face.

2.4 FABRICATE JOINERY FIXTURES

Carry out jointing, dowelling and other operations necessary for the proper assembly of the fittings as detailed, with fixings concealed unless otherwise detailed. Use glue joints where provision for shrinkage is not required, with contact surfaces, glueing and pressure all applied to the glue manufacturer's requirements. Locate and drive connectors and fasteners to the bolt manufacturer's requirements. Scribe fit adjustable shelves with 4 shelf pins and locate force fit pin holes at 50 mm maximum centres in solid cheeks. Hang doors on concealed hinges.

2.5 MAKE CUT OUTS FOR APPLIANCES AND FITTINGS

Obtain fitting templates from the appliances and other fittings to be installed within joinery fixtures and bench tops. Ensure appliances and fittings can be installed with the required tolerances and clearances. Where bench tops are being provided under other work sections, provide templates and confirm dimensions to others.

2.6 FABRICATE DRAWERS

Construct drawers as detailed, using proprietary metal section drawer runners. Fit drawers with 3 mm clearance into the drawer space.

2.7 TRANSIT AND DELIVERY

Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather. Do not deliver fittings until floor, wall and ceiling surfaces are in place and the fittings can be placed in their final location.

2.8 INSTALL JOINERY FIXTURES

Scribe fit on site and install level, square, plumb and true to line and face.

2.9 COATING SYSTEM, PREPARATION

- Fill timber defects with proprietary wood filler. (e.g. cracks, holes, etc)
- Sand timber to a smooth even finish using 180 grit paper.
- Remove all sanding dust using air guns and tack rags.
- Ensure substrate is free from dust, grease, dirt and other contaminants.
- Ensure moisture content of the timber is less than 15% immediately before commencing coating operations.

2.10 COATING SYSTEM, APPLICATION

To coating manufacturer's requirements.

5503 BATHROOM AND TOILET FIXTURES

1. GENERAL

1.1 RELATED SECTIONS

Refer to 4601 GLAZING for mirrors and frameless shower and bath screens.

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 4121 Design for access and use of buildings and facilities by disabled persons

2. PRODUCTS

Refer to 4. drawings.

3. EXECUTION

3.1 RETAIN

Retain fixtures, fittings and hardware in the manufacturer's original packaging and ensure that units are complete with associated fixings and installation instructions.

3.2 INSPECTION

Before starting the installation of proprietary items, check relevant spaces and wall and floor finishes for any condition that would not allow the proper installation of any unit. Do not proceed until such conditions have been remedied.

3.3 LOCATE

Locate units at heights and/or locations shown on the drawings, or as required to comply with relevant Codes and Standards. For any dimension not shown or known, request direction before proceeding.

3.4 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting.

3.5 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

3.6 ADJUST

Adjust and check each operating unit for correct and smooth functioning. Replace those units that cannot be adjusted if they do not function correctly. Clean units and adjoining surfaces upon completing their installation.

3.7 REPLACE

Replace damaged or marked elements.

3.8 LEAVE

Leave work with parts fully and freely working and to the standard required by following procedures.

3.9 REMOVE

Remove debris, unused materials and elements from the site.

3.10 PROTECT

Protect units from damage or marking.

3.11 FINAL ADJUSTMENT

Where units are installed more than a month prior to project completion, return and make a final check and adjustment of units just prior to hand over, to ensure that they are operating correctly, fitted properly and are undamaged.

6401 VINYL SURFACING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

AS/NZS 1859 Reconstituted wood-based panels
 1859.2: Dry processed fibreboard
 1859.4 Hardboard

NZS/AS 1884 Floor coverings - resilient sheet and tiles - laying and maintenance practices.

BRANZ Bulletin 330: Thin flooring materials - 2 preparation and laying

1.2 QUALIFICATIONS

Carry out work using competent, experienced layers, familiar with the materials and techniques specified.

1.3 SAMPLES

Submit samples of sheet, tile and accessories to the owner, sufficient to show the pattern and the range of colour finish.

2. PRODUCTS

Floors

2.1 VINYL SHEET AND TILES

High vinyl content homogeneous monolayer flexible PVC sheet/tile flooring.

2.2 VINYL COVINGS

Commercial coving: pencil cove method, with butterfly mitres to all external and internal corners. Domestic coving: pencil cove or fillet cove method.

2.3 THERMO-WELDING

Manufacturer supplied colour matched weld rod.

3. EXECUTION

Preparing substrate

3.1 NEW CONCRETE

Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust. Check for moisture content by hygrometer to BRANZ Bulletin 330 and do not commence laying vinyl until readings for the whole area show 75% relative humidity or less.

General

3.2 STORAGE

Maintain rolls of sheet, packages of tiles and accessories undamaged and dry. Store rolls upright with other material on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.

3.3 HANDLING

Avoid distortion, stretching, marking and damage to edges while shifting, unrolling and handling sheet, tiles and accessories. Inspect for any faulty material. Do not use faulty or damaged material.

3.4 BEFORE COMMENCING WORK

Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.

3.5 INSPECT

Inspect the substrate to ensure it is of the standard required for work in this section.

3.6 LAYING

Carry out the whole of the work to NZS/AS 1884, BRANZ Bulletin 330 "Thin flooring materials - 2 preparation and laying" and to the flooring manufacturer's requirements.

3.7 LAYOUT

Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

Vinyl floor laying

3.8 PREPARATION

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for conditioning of rolls and the working temperatures and conditions before, during and after laying. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side, of the work period.

3.9 ADHESIVE APPLICATION

Apply approved adhesive as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for open time, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

3.10 LAYING VINYL SHEET

Roll out, cut, leave to condition and install sheet vinyl to the vinyl manufacturer's requirements. Ensure there are no air bubbles or twisting, that the seams are kept clear of adhesive, and immediately the sheet is adhered roll with a 68 kg roller.

3.11 THERMO-WELDING VINYL SHEET

Machine groove and thermo-weld all seams in specified areas, heating the sheet and weld rod to a sufficient temperature to melt and fuse them together into a single mass. Trim the weld to leave a smooth, flush surface with the sheet.

3.12 CROSS JOINS

Plan and allow cuts to avoid cross joins. Obtain written approval of the owner before proceeding if cross joins are unavoidable. Cross joins are not acceptable in wet areas.

3.13 COVE VINYL

Pencil cove flooring to the specified height and finish off as detailed.

3.14 MITRES

Perform butterfly method to internal and external mitres. Thermo-weld mitres.

3.15 LAYING VINYL TILES

Set out from the centre of the area in two preparatory runs and modify to suit before laying tiles from the centre to the vinyl manufacturer's requirements. Ensure air is expelled and, as each section is completed, immediately roll with a 68 kg roller. Complete sections before scribing the perimeter tiles.

3.16 FIT VINYL SKIRTINGS

Fit skirtings in accordance with the skirting manufacturer's requirements.

3.17 FIT VINYL EDGING

Fit tapered vinyl edging to all borders, except where abutting carpet.

3.18 CLEAN

Leave vinyl flooring surfaces free of adhesive, dirt and debris. Vacuum off, damp mop with a low foam neutral detergent, with a pH level of 7 to 8. Allow to dry and finally buff with a rotary machine using suitable pads at 300 rpm. Polymer polishes to be used only where approved by the vinyl manufacturer and accepted by the owner.

Completion

3.19 ACCEPTANCE

Arrange for a final inspection of the completed work by the owner. Protect all surfaces until the completion of the works.

3.20 REMOVE

Remove unused materials from the site.

6501 CARPETING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

AS/NZS 2455.1 Textile floor coverings - Installation practice, Part 1: General

The New Zealand Carpet Manufacturers' Association Conditions of Warranty and installation guide

1.2 QUALIFICATIONS

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

2. PRODUCTS

2.1 UNDERLAY

2.2 CARPET

2.3 EDGE GRIPPER, TAPES, FIXING BARS

To AS/NZS 2455.1.

2.4 BINDER BARS

Anodised aluminium section with a fluted face.

2.5 ADHESIVE, UNDERLAY

To AS/NZS 2455.1.

2.6 ADHESIVE, CARPET

To AS/NZS 2455.1.

3. EXECUTION

3.1 COMPLY

Comply with the requirements of the carpet manufacturer including preparation of and procedures over the various substrates.

3.2 SUBSTRATE

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

3.3 PROTECTION

Protect adjoining work surfaces and finishes during installation and make good any damage to same.

3.4 TAPE

Tape for binding and seaming to be the type and width required by AS/NZS 2455.1 to suit the specified carpet and the standard of performance required.

3.5 LAYOUT

Plan the carpet layout so that: -
- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the main natural light source.

3.6 TEMPERATURE

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

3.7 STORAGE

Keep carpet dry and protected from damage, sharp bending or folding.

3.8 PREPARE FLOOR SURFACE

Prepare floors for laying to AS/NZS 2455.1 requirements.

3.9 INSTALLATION, UNDERLAY

Installation to AS/NZS 2455.1. Lay at right angles to the carpet direction.

3.10 INSTALLATION, TAPED JOINTS

Tape carpet joints, fix grippers to floor, install underlay and carpet, to AS/NZS 2455.1.

3.11 INSTALLATION, DIRECT STICK

Installation to AS/NZS 2455.1 requirements. Apply adhesive evenly over the entire substrate surface and lay the carpet with all edges, selvages and joints tightly butted and all completely bonded to the floor surface. Roll the carpet with a clean 25 kg roller and ensure complete contact with adhesive.

- 3.12 **INSTALLATION, DOUBLE BOND SYSTEM**
Installation to AS/NZS 2455.1.requirements. Apply adhesive on the underlay to AS/NZS 2455.1. and lay the carpet with all edges, selvages and joins tightly butted and all completely bonded to the underlay surface.
- 3.13 **INSTALLATION, PRE APPLIED ADHESIVE SYSTEM**
Installation to AS/NZS 2455.1.requirements. Lay underlay using solvent free primer to sub floor and to bond the carpet to the underlay. Lay the carpet with all edges, selvages and joins tightly butted and all completely bonded to the underlay surface.
- 3.14 **FIX TRIMS**
Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to AS/NZS 2455.1. Ensure that all junctions with other materials are neatly formed, with bars and trims securely fastened to the substrate, 20 mm from each end and at maximum 100 mm centres.
- 3.15 **TAKE AWAY**
Take away from the site all plant and all materials not used, leaving finished floor clean and without blemish.
- 3.16 **CLEAN**
On completion thoroughly vacuum the finished carpet.

6701 PAINTING AND PAPERHANGING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

OSH Guidelines for the management and removal of asbestos

Health and Safety in Employment Act 1992

BRANZ Bulletin 314: Removing paint coatings from houses

1.2 MANUFACTURER'S MANUALS

Refer to the paint manufacturer's manuals and follow their preparation, sequence and application requirements applying to each system. Ensure all paint coats in any system are supplied by the same manufacturer.

1.3 QUALIFICATIONS

Carry out work using competent and experienced painters and paperhangers.

1.4 HEALTH AND SAFETY

Refer to the requirements of the Health and Safety in Employment Act 1992 and if elimination or isolation is not possible, then minimise the hazards in this work.

Refer to BRANZ Bulletin 314 Removing paint coatings from houses for the required procedures and precautions when:

- Treating or removing lead based paint.
- Burning off paint.
- Sanding off paint.
- Using solvent based paint removers.

1.5 CONTROL SAMPLES

Prepare samples of the finished work as scheduled, including preparation and colour as specified. Obtain approval of the appearance before proceeding. Refer to 4. SELECTIONS.

2. PRODUCTS

2.1 PAINT

To the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.

2.2 GAP FILLERS

Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.

3. EXECUTION

3.1 INSPECT

Inspect surfaces for painting and report to the owner any that will not, after the preparatory work laid down by the paint manufacturer, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable painting and/or paperhanging work to proceed.

3.2 PROTECT

Cover up adjoining surfaces and areas liable to damage or over-painting.

3.3 REMOVE HARDWARE

Remove hardware and door/window furniture and replace on completion. Do not paint over permanently attached hinges, or any hardware items which cannot be removed. Refer to 4. SELECTIONS.

3.4 PRIMING AND SEALING

Ensure that priming and sealing work needed before or during construction is carried out when required.

3.5 ENVIRONMENTAL CONDITIONS

Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.

3.6 SELECTIONS

Confirm all selections, colours and finishes for both paint and wallpaper with the owner, before commencing work.

3.7 LEAD

Lead-based paint: treat as set out in BRANZ Bulletin 314 Removing paint coatings from houses.

3.8 SHARP EDGES, CRACKS AND HOLES

Repair as required by the paint manufacturer.

3.9 PREPARE SURFACES

Prepare surfaces to be coated as required by the paint manufacturer. Make good all damage and defects.

- 3.10 PAINT APPLICATION
Apply paint by brush and/or roller to suit the location of the coating and to the paint manufacturer's requirements. Do not spray on site without express permission.
- 3.11 DEFECTIVE WORK
Correct defective work immediately. Recoating to follow the selected paint system's requirements.
- 3.12 SCUFF BETWEEN COATS
Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.
- 3.13 FINISHED PAINT SURFACES
Finished paint surfaces to show uniformity of gloss and colour, with the correct thickness for each coat, and freedom from painting defects. Ensure finished work is clean and free of any disfigurement.
- 3.14 CONFIRM WALLPAPER
Confirm that all rolls of each pattern are from the same batch.
- 3.15 WALLPAPER INSTALLATION
Seal or size walls. Use only full length drops, completely glued, pattern matched and hung vertically without bubbles or visible butt joints. Scribe cut paper onto surrounding trim.
- 3.16 CLEAN
Clean adjoining surfaces, glass and fittings of any paint contamination.
- 3.17 REPLACE
Replace hardware without damage to the hardware or the adjoining surfaces.
- 3.18 TAKE AWAY
Take away from the site unused painting materials and equipment.

7101 HOT AND COLD WATER SYSTEM- PLUMBER TO EDIT !

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC G12/AS1	Water supplies
NZBC H12/AS1	Energy Efficiency
AS/NZS 2642	Polybutylene pipe fittings 2642.2: Polybutylene (PB) pipe for hot and cold water applications 2642.3: Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
NZS 3501	Specification for copper tubes for water, gas and sanitation
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4606	Storage water heaters 4606.3: Specific requirements for water heaters with composite shells
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
DIN 8077	Polypropylene (PP) Pipe dimensions
DIN 8078	Polypropylene (PP) Pipes Types 1, 2 & 3. General Quality Requirements and Testing.

Plumbers, Gasfitters and Drainlayers Act 1976

1.2 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a plumber registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

2. PRODUCTS

2.1 POLYETHYLENE WATER PIPE

To NZS 7602, type 5 (over 0.7 kPa) complete with fittings and accessories to the pipe manufacturer's requirements and all brand matched.

2.2 WATER METER

To the requirements of the network utility operator.

2.3 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1: Water supplies.

2.4 TEMPERING VALVE

Tempering valve to NZS 4617 to NZBC G12/AS1: Water supplies.

2.5 TANKS

Pre-formed black polyethylene complete with access opening and lid and overflow tray.

Materials - hot water heating appliances

2.6 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Components

2.7 INSULATION

Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements.

2.8 PROTECTIVE TAPE

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

3. EXECUTION

3.1 HANDLE AND STORE

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

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

3.2 EXECUTION GENERALLY

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

- 3.3 **CORE HOLES AND SLEEVES**
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.
- 3.4 **CONCEAL**
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.
- 3.5 **CORROSION**
Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.
- 3.6 **THERMAL MOVEMENT**
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.
- 3.7 **PIPE SIZE**
Flow rates to each outlet to be no less than those given in NZBC G12/AS1: Water supplies, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in table 4, Tempering valve and nominal pipe diameters.
- 3.8 **ELECTROLYTIC ACTION**
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 3.9 **EXCAVATE**
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application – pipework installation

- 3.10 **WATER MAIN**
Lay a minimum of 500 mm below ground level (600 mm under driveways) from the utility network operator's supply through a gate valve and meter to a box to the building. Lay marker tape above the water main in backfill.
- 3.11 **POLYBUTYLENE/POLYETHYLENE WATER SUPPLY**
Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixings and related to the pipe manufacturer's specifications, all to NZBC G12/AS1. Conceal pipework and pressure test before the wall linings are fixed.
- 3.12 **OUTLET LOCATIONS**
Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.

Application - hot water systems

- 3.13 **INSTALLING HOT WATER PIPE INSULATION**
Insulate all hot water pipes to NZBC H12/AS1 and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanized steel wire ties.
- 3.14 **INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS**
Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.
- 3.15 **INSTALL TEMPERING VALVE**
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

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

Installation – tapware

- 3.17 **INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED**
Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.
- 3.18 **INSTALL TAPWARE**
Install taps and faucets to the manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.
- 3.19 **INSTALL HOT WATER CYLINDER OVERFLOW TRAY**
Install drained overflow tray to hot water cylinder to NZBC G12/AS1.
- 3.20 **LEAVE**
Leave water services in proper working order. Pressure test to ensure no leakage and leave in proper working order.
- 3.21 **CLEAN**
Clean tapware and fittings. Remove unused materials from the site.

7401 RAINWATER SYSTEMS

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are: -

AS 1397 Steel sheet and strip - hot-dipped, zinc-coated or aluminium/zinc-coated

BRANZ Bulletin 304: Flashing design.

BRANZ Bulletin 465: Domestic flashing installation.

1.2 QUALIFICATIONS

Workers to be either competent craftsman plumbers, or registered plumbers working under the direction of a craftsman plumber, or roofers, familiar with the materials and techniques specified.

2. PRODUCTS

Aluminium/zinc alloy coated pre-painted steel

2.1 ALUMINIUM/ZINC ALLOY PRE-PAINTED SHEET STEEL

0.55 mm sheet steel coated to AS 1397, pre-painted.

2.2 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

2.3 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES

Seam jointed and complete with stand-off brackets and galvanized screws.

Materials - fascia/barge system

2.4 EXTERNAL FASCIA/BARGE SPOUTING SYSTEM

Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer's requirements.

General

2.5 RAINWATER HEADS, DROPPERS, OVERFLOWS

Fabricate and install as detailed.

2.6 FLASHINGS GENERALLY

0.55 mm sheet steel galvanized to AS 1397, aluminium/zinc coated to AS 1397, 1.8 mm (20 kg/m²) copperised pure lead, 0.5 mm thick hard copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 304 Flashing design.

2.7 DOWNS

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

3. EXECUTION

3.1 ELECTROLYTIC ACTION

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

Check compatibility of metals used for rainwater goods, against the materials used for roofing and flashings. Notify any incompatibility to the owner and obtain written approval for amendments to selections.

3.2 LIAISON

Ensure liaison with associated installations to confirm material selections are compatible and required flashing work is completed.

3.3 INSTALLATION GENERALLY

Install and fix spouting and downpipes to the manufacturers requirements. Install system to properly drain water from the roof area and so that water will not enter the building under overflow conditions.

Aluminium/zinc alloy coated steel pre-painted

3.4 FIT ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED SPOUTING

Fit brackets at maximum 800 mm centres and fix with galvanized screws. Set to fall to outlets. Make joints with silicone sealed and pop-riveted to the spouting manufacturer's requirements.

3.5 FIT ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED DOWNPIPES

Fit stand-off brackets at maximum 1200 mm centres and fix with galvanized screws. Set pipes plumb and clear of the wall. Silicone seal joints. Discharge into stormwater drain.

General

- 3.6 **FLASHINGS**
Scribe fit, fold, lap, seam, or run solder as required by the metal, to flash all roof penetrations, roofing and exterior joinery to prevent weather penetration. Except at expansion joints, provide 2 rows of rivets to overlapping sheet joints. Install and fix flashings and flashing joints to the criteria stated in BRANZ Bulletins 304 Flashing design and 465 Domestic flashing installation.
- 3.7 **INSTALL DOMES**
Install wire mesh domes at the top of downpipes.
- 3.8 **INSTALL SPOUTING MESH**
Install mesh into spoutings, strictly in accordance with the mesh manufacturer's requirements.
- 3.9 **FLASH ROOF LIGHTS**
Flash to roofing to the manufacturer's specifications.
- 3.10 **LEAVE**
Leave rainwater services in proper working order and all flashing work completed to keep the building weathertight.
- 3.11 **CLEAN UP**
Wash out gutter daily and on completion to remove swarf. Take away from the site unused materials and elements.

4. SELECTIONS

Components / accessories

- 4.1 **EXTERNAL FASCIA/BARGE SPOUTING SYSTEM**
Brand/type: PALTEC

7402 SANITARY PLUMBING

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene 2.0 Fixture construction and installation 3.0 Location of sanitary fixtures
NZBC G13/AS1	Foul water - sanitary plumbing
AS/NZS 1260 AS/NZS 3500	PVC pipes and fittings for drain, waste and vent applications Plumbing and drainage Part 2: Sanitary plumbing and drainage
NZS 7641	Unplasticised PVC waste and ventilating pipe, fittings and accessories, 32 mm, 40 mm and 50 mm

Plumbers, Gasfitters and Drainlayers Act 1976

1.2 QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

2. PRODUCTS

2.1 uPVC WASTE, SOIL AND VENT PIPES

uPVC pipe to NZS 7641 and 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.

2.3 SEALANT, SANITARY FIXTURES

For between sanitary fixtures and accessories and adjacent floor or wall surfaces.
1-part, silicone, containing mildew resistant agents.
Colour: White

3. EXECUTION

3.1 EXECUTION GENERALLY

Carry out this work and complete all tests to AS/NZS 3500 Part 2
Carry out this work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and G13/AS1.

3.2 ELECTROLYTIC ACTION

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

3.3 INSTALL SANITARY FIXTURES

Fit and install sanitary fixtures and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

3.4 INSTALL TRAPS, WASTE AND VENT PIPES

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500 Part 2/NZBC G13/AS1. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown.
Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.5 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.6 INSTALL SANITARY ACCESSORIES

Install sanitary accessories as selected.

3.7 TEST

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

3.8 CLEAN UP

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

7403 DRAINAGE

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC B1/AS1	Structure – general, 6.0 Drains
NZBC E1/AS1	Surface water
	3.0 Drainage system materials and construction
NZBC G13/AS2	Foul Water – drainage

AS/NZS 1254	PVC pipes and fittings for storm and surface water applications
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 1546.1	Septic tanks
AS/NZS 1547	On site domestic wastewater management
AS/NZS 4130	Polyethylene pressure pipes (PE)
AS/NZS 4671	Steel reinforcing materials
NZS 3107	Precast concrete drainage and pressure pipes
NZS 3104	Specification for concrete production
AS/NZS 3500	Plumbing and drainage
	Part 2: Sanitary plumbing and drainage
	Part 3: Stormwater drainage
NZS 7643	Installation of unplasticised PVC pipe systems

Plumbers, Gasfitters and Drainlayers Act 1976

1.2 AS-BUILT DRAWINGS

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 hold a current licence within the terms of the Plumbers Gasfitters & Drainlayers Act 1976 and be experienced, competent and familiar with the materials and techniques specified.

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 uPVC PIPES

uPVC Pipes, bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

2.4 FIELD DRAINS

Plastic pipes for field drains perforated (straight sections or coiled) with filter fabric to prevent silting of the pipe.

2.5 GULLY TRAPS

To NZBC G13/AS2: 3.3, complete with grating.

2.6 SURFACE WATER SUMP GRATINGS

Cast iron frame with lift-up grating.

2.7 STRIP DRAIN CHANNEL

Proprietary, modular, variable invert, PVC or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

2.8 INSPECTION COVERS

Cast iron frame with screw-down cover.

2.9 DRAINAGE AND FILLING MATERIALS

Granular:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm.
Selected:	Fine grain soil or granular material suitable for bedding; excluding topsoil.
Ordinary:	Top soil or other excavated materials.

2.10 SEPTIC TANKS

Cylindrical or rectangular septic tanks to AS/NZS 1546.1 made of pre-cast concrete 30 MPa with steel bar reinforcement, or cylindrical septic tanks to AS/NZS 1546.1 made of pre-cast concrete 35 MPa with steel fibre reinforcement, or cylindrical septic tanks, material to approval, all other requirements to AS/NZS 1546.1 made of ribbed polyethylene.

3. EXECUTION

3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.

- 3.2 **MANUFACTURER'S REQUIREMENTS**
All drainage installations to the pipe and fitting manufacturer's requirements.
- 3.3 **DRAINAGE GENERALLY**
Carry out drainage work and tests to AS/NZS 3500 Part 2 (sanitary drainage) AS/NZS 3500 Part 3 (stormwater drainage) as modified by NZBC B1/AS1: 6.0. Lay uPVC pipe systems to relevant sections of NZS 7643.
- 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 50 mm 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 **LAY SUBSOIL DRAINS**
Lay perforated piping firmly in a granular bed in straight runs to correct gradients, discharging into a cesspit. Carry the granular bed up over the pipes without disturbing them to a total depth of 300 mm and cover with geotextile fabric to the pipe manufacturer's requirements. Carry the high end of all lines up to the surface to allow for flushing out and finish with a protected removable cap.
- 3.8 **INSTALL SURFACE WATER SUMP**
To NZBC E1/AS1, complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.
- 3.9 **INSTALL STORMWATER INSPECTION CHAMBERS**
To NZBC E1/AS1, with a 75 mm fall across the chamber and with channels to form a cascade where necessary. Channel top should be 100 mm above the pipe soffit. Bench from channels at 1V on 10H. Benching should be made of 17.5 MPa concrete vibrated to smooth finish. Plastering is not allowed. Fit a cast iron cover and frame.
- 3.10 **INSTALL FOUL WATER INSPECTION CHAMBERS**
To NZBC G13/AS2, with ceramic channels to form a 75 mm fall across the chamber. Channel top should be 100 mm above the pipe soffit. Bench from channels 1V on 10H. Benching should be made of 17.5 MPa concrete vibrated to smooth finish. Plastering is not allowed. Fit a cast iron cover and frame.
- 3.11 **SOAKHOLES OR TRENCHES**
Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all as directed by the territorial authority.
- 3.12 **CONCRETE ENCASEMENT**
Concrete encase shallow drains and drains under driveways, on a 100 mm deep 17.5 MPa concrete bed reinforced with three 10 mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100 mm 17.5 MPa concrete.
- 3.13 **FIELD TEST**
Field test drains for watertightness (UPVC to NZS 7643 section 11) to the satisfaction of the territorial authority inspector.
- 3.14 **BACKFILL**
Backfill drain lines in 150 mm layers, well tamped but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above the finished ground line.

1. GENERAL

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC F6/AS1	Lighting for emergency
NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC F8/AS1	Signs
AS/NZS 2293	Emergency evacuation lighting for buildings
AS/NZS 3000	Electrical regulations - Buildings, structures and premises
AS/NZS 3008	Electrical installations - Selection of cables 3008.1.2: Typical New Zealand installation conditions
AS/NZS 3086	Telecommunications installations – Integrated telecommunications cabling systems for small office/home office premises.
AS 3786	Smoke alarms
NZS 6401	PVC-insulated cables for electric power and lighting
Electricity Regulations 1997	
New Zealand electrical codes of practice (ECP)	

1.2 COMPLY

Comply with the Electricity Regulations 1997, AS/NZS 3000, AS/NZS 3008.1.2 and the New Zealand electrical codes 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.

1.3 QUALIFICATIONS

Carry out work by or under the direct supervision of a holder of a practising licence under the Electricity Regulations 1997.

1.4 CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance to the owner, as required by the Electricity Regulations 1997, and in particular, clauses 16, 34 and 35. Allow the network utility operator to view before the meter installation, listed work inspection, polarity check and liveing of supply.

2. EXECUTION

2.1 MAIN SUPPLY

Lay underground mains to the network utility operator's requirements. Excavate trench, install cable and marker tape and backfill.

2.2 METER BOX

Fit to meter box manufacturer's and network utility operator's requirements where detailed. Recess into external wall and flash to weatherproof. Arrange for meter installation and connection.

2.3 DISTRIBUTION BOARD

Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure is maintained.

2.4 CIRCUIT PROTECTION

Install MCBs to protect each final sub circuit sized for circuit maximum loading.

2.5 EARTH LEAKAGE PROTECTION

RCD protection to AS/NZS 3000

Domestic

Install RCD protection at the switchboard of final sub circuits controlling socket outlets except for:

- Fixed cooking equipment
- Lighting

2.6 SET-OUT

Unless specifically detailed, the position of outlets and equipment shown on drawings is indicative of requirements. Study documents and site conditions to ensure no conflict with other services or features will arise. 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.

2.7 CABLING

Install with a maximum of 10 light outlet units or 6 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. 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.

2.8 WALL BOXES

Flush mounted in cavity construction. Fix vertically mounted wall boxes to studs. Fix horizontally mounted switched socket outlet wall boxes to solid blocking or noggs. Fix switch panel wall boxes to solid blocking.

2.9 SWITCH AND SOCKET UNITS

Fit all single and double switch units and socket at the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000 mm
Socket Units: 150 mm above work benches
400 mm elsewhere

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch.

2.10 ISOLATING SWITCHES

Locate isolating switches in agreed positions when not specifically shown on the drawings.

2.11 LIGHT FITTINGS

Install light fittings in locations and at heights detailed, and in accordance with the fitting manufacturer's requirements.

2.12 ELECTRIC HOT WATER SYSTEM

Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under 7101 HOT AND COLD WATER SYSTEM.

2.13 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to AS/NZS 3000; the Electricity Regulations 1997 and the fitting manufacturer's requirements.

2.14 TELEPHONE WIRING

Install telephone cable to telephone outlet positions shown on the drawings. Install in conduit for outlets on masonry surface. Fix and connect BT jack point outlets to NZ Telecom requirements and terminate wiring at incoming terminal block.

2.15 TELEPHONE DRAW WIRES

Supply draw wires from accessible positions for the telephone outlets shown on the drawings. Install in conduit for outlets on masonry surface.

2.16 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 4 SELECTIONS for schedules of fittings.

2.17 BATHROOM ELECTRICAL FIXTURES

Install electrical fixtures specified in other parts of this specification. Connect the following bathroom and toilet electrical items: -

- Heated towel rails: Install to manufacturers requirements.
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Extract fans: Install to manufacturers requirements.
- Pan vents: Connect pan vents installed by the plumber.

2.18 EXTERIOR SERVICES

Provide circuits and connections for exterior installations, including ELV 12 volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, connect mains voltage outlets with cable enclosed in conduit, or with 2 core neutral screen cable with heavy duty grade 3.2 mm PVC sheath, with the neutral screen conductors terminated in a soldered or compression cable lug, PVC sleeved, and connected as the earth continuity conductor.

Connect to all ELV outlets with 230v rated cable with minimum 2.5 mm² conductor, and to ensure voltage drop to lamp does not exceed 0.8 volts. Connect lamps 50 watt or greater matched to no more than one per transformer, located as close as practicable to the lamp. Ensure transformers and light fittings are adequately cooled and watertight if liable to immersion.

2.19 MAIN EARTH

Provide a plastic toby box or UPVC tube to contain and protect the earth pin. Fix the connecting earth wiring closely and securely against wall surfaces.

2.20 LABELLING

Complete all labelling in clear machine printed permanent manner. 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.

2.21 COMPLETION

Leave work operating correctly, with equipment clean and all lamps operational.

McRaeWay Homes

RISK MATRIX

FILL IN BLUE DROP BOXES ON LEFT OF SCREEN

JOB NAME:		BISHOP BUILDERS LTD	
SITE ADDRESS		OAMARU	JOB No. 877
RISK FACTOR (FACE)	RISK (SCORE)	(Score)- DISCRIPTION - (Notes)	
A: WIND ZONE			
	LOW	(0)-LOW WIND ZONE AS DESCRIBED BY NZS 3604	
DINING	H	MEDIUM	(0)-MEDIUM WIND ZONE AS DESCRIBED BY NZS 3604
LOUNGE	H	HIGH	(1)-HIGH WIND ZONE AS DESCRIBED BY NZS 3604
GARAGE	H		
BEDROOM	H	VERY HIGH	(2)-VERY HIGH WIND ZONE AS DESCRIBED BY NZS 3604
B:NUMBER OF STOREYS		LOW	(0)-ONE STOREY
		MEDIUM	
DINING	L		
LOUNGE	L		(1)-TWO STOREYS IN PART
GARAGE	L	HIGH	(2)-TWO STOREYS
BEDROOM	L	VERY HIGH	(4)-MORE THAN TWO STOREYS
C: ROOF / WALL INTERSECTION DESIGN		LOW	(0)-ROOF-TO-WALL INTERSECTION FULLY PROTECTED (e.g. HIP AND GABLE ROOF WITH EAVES)
		MEDIUM	(1)-ROOF-TO-WALL INTERSECTION PARTLY EXPOSED (e.g. HIP AND GABLE ROOF WITH NO EAVES)
		HIGH	(3)-ROOF-TO-WALL INTERSECTION FULLY EXPOSED (e.g. PARAPETS OR EAVES AT GREATER THAN 90deg TO VERTICAL WITH THE SOFFIT LINING)
DINING	L		
LOUNGE	VH		
GARAGE	L	VERY HIGH	(5)-ROOF ELEMENTS FINISHING WITHIN THE BOUNDARIES FORMED BY THE EXTERIOR WALLS (e.g. LOWER ENDS OF APRONS, CHIMNEYS ETC.)
BEDROOM	L		
D:EAVES WIDTH		LOW	(0)-GREATER THAN 600mm AT FIRST FLOOR LEVEL
DINING	L	MEDIUM	(1)-450-600mm AT FIRST FLOOR LEVEL, OR OVER 600MM AT SECOND FLOOR LEVEL
LOUNGE	L	HIGH	(2)-100-450mm AT FIRST FLOOR, OR 450-600mm AT SECOND FLOOR LEVEL
GARAGE	L		
BEDROOM	L	VERY HIGH	(5)-0-100mm AT FIRST FLOOR, OR 100-450mm SEC FLR. OR 450-600mm 3RD FLR.
E: ENVELOPE COMPLEXITY		LOW	(0)-SIMPLE RECTANGULAR, L, T or BOOMERANG SHAPE, WITH SINGLE CLADDING TYPE
		MEDIUM	(1)-MORE COMPLEX, ANGULAR OR CURVED SHAPES (e.g. Y OR ARROWHEAD) WITH SINGLE CLADDING TYPE
DINING	M		
LOUNGE	M	HIGH	(3)-COMPLEX, ANGULAR OR CURVED SHAPES (e.g. Y OR ARROWHEAD) WITH MULTIPLE CLADDING TYPES
GARAGE	M		
BEDROOM	L	VERY HIGH	(6)-AS FOR HIGH RISK, BUT WITH JUNCTIONS NOT COVERED IN C. OR F. OF THIS TABLE (e.g. BOX WINDOWS, PERGOLAS, MULTI-STOREY RE-ENTRANTS SHAPES ETC)
F:DECK DESIGN		LOW	(0)-NONE, TIMBER SLAT DECK OR PORCH AT GROUND LEVEL
		MEDIUM	(2)-FULLY COVERED IN PLAN BY ROOF, OR TIMBER SLAT DECK ATTACHED AT FIRST FLOOR LEVEL
DINING	L		
LOUNGE	L	HIGH	(4)-ENCLOSED DECK EXPOSED IN PLAN OR CANTILEVERED AT FIRST FLOOR LEVEL
GARAGE	L		
BEDROOM	L	VERY HIGH	(6)-ENCLOSED DECK EXPOSED IN PLAN OR CANTILEVERED AT SECOND FLOOR LEVEL OR ABOVE

CLIENT NAME	ADDRESS	JOB No.
BISHOP BUILDERS LTD	OAMARU	877

PERMISSABLE CLADDINGS SUMMARY SHEET

RISK SCORE CALCULATION SHEET

AS PER E2/AS1 2005

Table 3: Suitable wall claddings

Paragraphs 3.1.2, 3.4.1.1, 3.4.2.1, 3.4.2.2, 3.4.3.2, 9.1.1, 9.4.1.2, 9.4.1.3, 9.6, Figure 1

Risk Score	Suitable wall claddings ¹	
	Direct fixed to framing	Over 20 mm minimum drained cavity
DINING FACE	2	
	Timber weatherboards - all types Fibre cement weatherboards Vertical profiled metal ³ - corrugated Fibre cement sheet Plywood sheet EIFS	Masonry veneer ² Stucco Horizontal profiled metal ³ - corrugated and trapezoidal only - - - -
LOUNGE FACE	7	
	Bevel-back weatherboard Vertical board and batten Vertical profiled metal ³ - corrugated only - - -	Masonry veneer ² Stucco Horizontal profiled metal ³ Rusticated weatherboards Fibre cement weatherboards Fibre cement sheet Plywood sheet EIFS --
GARAGE FACE	2	
	Timber weatherboards - all types Fibre cement weatherboards Vertical profiled metal ³ - corrugated and symmetrical trapezoidal only Fibre cement sheet Plywood sheet EIFS	Masonry veneer ² Stucco Horizontal profiled metal ³ - corrugated and trapezoidal only - - - -
BEDROOM FACE	1	
	Timber weatherboards - all types Fibre cement weatherboards Vertical profiled metal ³ - corrugated and symmetrical trapezoidal only Fibre cement sheet Plywood sheet EIFS	Masonry veneer ² Stucco Horizontal profiled metal ³ - corrugated and trapezoidal only - - - -

- NOTES:
- 1 The wall claddings in this table are limited to those covered in this Acceptable Solution.
 - 2 Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.
 - 3 Refer E2/AS1 Figure 38 for profiles.
 - 4 Except stucco over a fibre cement backing.

PRODUCT INFORMATION

Specification for the Rinnai Timberflame Radius ETR

SPECIFICATIONS

	RADIUS		COMPACT	LUMINA		ARRIVA	CENTRUM		REFLECTION	
	MANUAL	ETR		800	1000		MANUAL	ETR	MANUAL	ETR
Height	700mm	700mm	645mm	680mm	680mm	675mm	760mm	760mm	580mm	580mm
Width	915mm	915mm	750mm	825mm	1025mm	900mm	650mm	650mm	590mm	590mm
Depth	400mm	400mm	280mm	400mm*	400mm*	365mm*	510mm	510mm	500mm*	500mm*
Input (Max)	33MJ/h	33MJ/h	25MJ/h	30MJ/h	40MJ/h	31.5 MJ/h	35MJ/h	35MJ/h	30MJ/h	30MJ/h
Output High	6.6kW	6.5kW	5.0kW	NB**	NB	7kW	7.0kW	7.0kW	6.5kW	6.5kW
Output Low	3.5kW	1.8kW	1.6kW	NB**	NB	1.8kW	3.5kW	1.8kW	2.3kW	2.3kW
Outer Flue (Diameter)	150mm	150mm	150mm	250mm	250mm	80mm	150mm	150mm	150mm	150mm
Inner Flue (Diameter)	100mm	100mm	100mm	200mm	200mm	50mm	100mm	100mm	100mm	100mm
Mantel Height (mm)	300mm	300mm	300mm	300mm	300mm	200mm	NA	NA	300mm	300mm
Mantel Depth (Max)	150mm	150mm	150mm	150mm	150mm	150mm	NA	NA	150mm	150mm
Standard Colours	Satin Black with Black Nickel Rods	Satin Black with Black Nickel Rods Silver with Black Nickel Rods	Satin Black Stainless Steel	Satin Black 'Classic' Stainless Steel 'Contemporary'	Satin Black 'Classic' Stainless Steel 'Contemporary'	'Midnight' Black Glass 'Plasma' Silver Glass 'Shine' Stainless Steel 'Classic' Matt Black Steel	Satin Black with Black Nickel Rods	Satin Black with Black Nickel Rods Silver with Black Nickel Rods	Pearlescent Black Dark Bronze Champagne Silver Frame Pearlescent Black Trims	Pearlescent Black Dark Bronze Champagne Silver Frame Pearlescent Black Trims
Optional	Silver, Black Nickel or Gold Rods	Silver with Black Nickel Rods	-	River Stones Black Coals	River Stones Black Coals	-	Silver, Black Nickel or Gold Rods	Silver, Black Nickel or Gold Rods	Matt Stainless Steel Trims Pearlescent Black Dress Guard	Matt Stainless Steel Trims Pearlescent Black Dress Guard
Gas Type	Natural gas or LPG									
HEATS AREA UP TO										
Warm Zone	84m ²	84m ²	78m ²	NB	NB	95m ²	90m ²	90m ²	84m ²	84m ²
Medium Zone	72m ²	71m ²	66.5m ²	NB	NB	80m ²	76.5m ²	76.5m ²	72m ²	72m ²
Cool Zone	61m ²	60m ²	56m ²	NB	NB	70m ²	65m ²	65m ²	61m ²	61m ²

* Excludes Facets on Arriva and Spacer on Reflection.

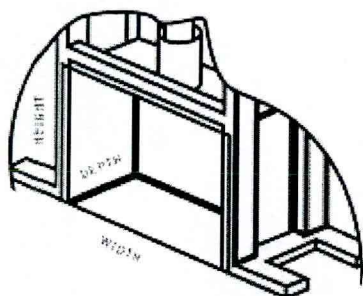
** While the Rinnai Lumina provides some heating functionality, it is primarily a decorative open fire. This information is not intended as an installation guide. Please consult product specification, available at www.rinnai.co.nz, by clicking the Tradesmart link. Specifications may change without notice.

** When installing a gas flame fire into an existing masonry chimney the product is required to sit on non-combustible material.

Heating Zone Guide



- WARM ZONE
- MEDIUM ZONE
- COOL ZONE



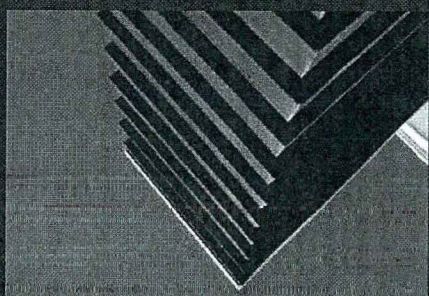
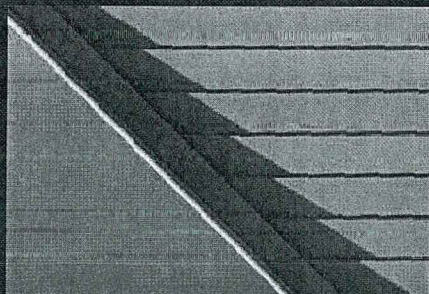
Model	Timberflame Radius		Timberflame Compact	Lumina 800	Lumina 1000	Arriva	Reflection Advance	Reflection Elevate	Reflection Amplify
	Manual	ETR							
CUTOUT DIMENSIONS/ (For installation with Zero Clearance Box)									
Height	735-750mm	735-750mm	675mm	NA	NA	NA	*	735mm	735mm
Width	790-820mm	790-820mm	680mm	NA	NA	NA	*	700-720mm	700-720mm
Depth (Min)	435mm	435mm	370mm	NA	NA	NA	*	550mm	550mm
CUTOUT DIMENSIONS/ (For installation without Zero Clearance Box)									
Height	585-690mm	585-690mm	640mm	665mm	665mm	660-665mm	585mm	*	*
Width	590-900mm	590-900mm	590-740mm	800mm	1000mm	860mm	590-790mm	*	*
Depth	410mm	410mm	360mm	450mm	450mm	380mm (with direct flow) 475mm (with extension)	410mm	*	*
ZERO CLEARANCE BOX DIMENSIONS									
Height	730mm	730mm	675mm	*	*	*	*	730mm	730mm
Width	790mm	790mm	680mm	*	*	*	*	690mm	690mm
Depth	435mm	435mm	370mm	*	*	*	*	550mm	550mm

* For the Rinnai Lumina and Rinnai Arriva the Zero Clearance Box is an integrated component of the appliance and not required as a separate item.

- 1 This is the size of the cavity required to install the appliance WITH a Zero Clearance Box.
- 2 This is the size of the cavity required to install the appliance WITHOUT a Zero Clearance Box.
- 3 This is the dimension of the Zero Clearance Box itself excluding any flanges.

This information is not intended as an installation guide. Please consult product specification, available at www.rinnai.co.nz, by clicking the Tradesmart link. Specifications may change without notice.

James Hardie®



TECHNICAL SPECIFICATION

Linea®
WEATHERBOARD

NEW ZEALAND
APRIL 2006

CONTENTS

SECTION	PAGE
1 APPLICATION & SCOPE	2
1.1 Application	2
1.2 Scope	2
1.3 Details	2
1.4 Specific Design	2
2 DESIGN	3
2.1 Compliance	3
2.2 Responsibility	3
2.3 Site & foundation	3
2.4 Ground clearances	3
2.5 Moisture management	3
2.6 Structure	3
2.7 Wind Loading	3
2.8 Structural bracing	3
2.9 Fire rated walls	3
2.10 Energy efficiency	3
3 FRAMING	4
3.1 General	4
3.2 Dimensions	4
3.3 Timber Grade	4
3.4 Durability	4
3.5 Frame Construction	4
3.5.1 Direct Fixed Construction Method	4
3.5.2 Cavity Construction Method	4
3.6 Tolerances	4
4 PREPARATION	4
4.1 Building wrap	4
4.2 Flashing	4
4.3 Vent strip	4
4.4 Cavity battens	4
4.5 Intermediate support	5
4.6 Corners	5
4.7 Junctions and Penetrations	5
5 FIXING LINEA® WEATHERBOARD	5
5.1 General	5
5.2 Fastener durability	5
5.3 Nail Sizes and Fixing Method	5
5.4 Gun nailing	6
6 JOINTING	6
7 FINISHING	6
7.1 Preparation & priming	6
7.2 Sealants	6
7.3 Painting	6
8 STORAGE & HANDLING	6
9 MAINTENANCE	6
10 PRODUCT INFORMATION	7
10.1 Manufacturing & classification	7
10.2 Trim	7
10.3 Durability	7
10.3.1 Resistance to Moisture/Rotting	7
10.3.2 Resistance to Fire	7
10.4 Product Sizes and Mass	7
10.5 Size and Weight	7
11 SAFE WORKING PRACTICES	7
12 PRODUCT SIZES	8
13 ACCESSORIES	9
14 DETAILS	11
15 WARRANTY	37

1 APPLICATION AND SCOPE

1.1 APPLICATION

Linea® Weatherboard is a 16mm thick, preprimed fibre cement weatherboard and is classified as lightweight wall cladding suitable for residential and light commercial construction using timber framed external walls. Linea® Weatherboard is available in 135mm, 150mm and 180mm widths.

James Hardie also has available

- Fascia and barge in two widths. Fascia is a 16mm thick, pre-primed fibre cement product.
- Trim in a variety of widths for use as decorative trims around openings and external corners. Trim is a 16mm thick, pre-primed fibre cement product.

If you are a specifier...

Or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

If you are an installer...

Ensure that you follow the design, moisture management and associated figures and material selection provided by the designer and the James Hardie Installation Manual.

All the details provided in this document must be read in conjunction with the specifiers specification.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or, if you need more information, visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

1.2 SCOPE

This specification covers the use of Linea® Weatherboard for buildings that fall within the scope of limitations of NZBC Acceptable Solution 'E2/AS1', paragraph 1.1.

This specification includes the use of Linea® Weatherboard in both direct to stud and cavity construction method and must be read in conjunction with the current BRANZ Appraisal for Linea® Weatherboard.

1.3 DETAILS

Various Linea® Weatherboard details are provided at the rear of this document. This specification and details in CAD file are also available to download from our website at www.jameshardie.co.nz.

1.4 SPECIFIC DESIGN

For use of Linea® Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

James Hardie
Fax 0800 808 988
literaturefeedback@jameshardie.co.nz

2 DESIGN

2.1 COMPLIANCE

Linea® Weatherboard has been appraised by BRANZ. Refer to Appraisal Certificate number 446 (2005) and 447 (2005) at www.branz.co.nz or www.jameshardie.co.nz

Note: the scope of the Appraisal Certificate takes precedence over the scope of this Specification.

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and figures which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All dimensions shown are in millimetres unless noted otherwise. All New Zealand Standards referenced in this manual are current edition and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 SITE & FOUNDATION

The site on which the building is situated must comply with NZBC (New Zealand Building Code) Acceptable Solution E1/AS1 'Surface Water'. Foundation design must comply with the requirements of NZS 3604 'Timber Framed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulating.

2.4 GROUND CLEARANCES

The floor must have a minimum clearance to paved or unprotected ground as required by NZS 3604.

Linea® Weatherboards must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604. The bottom of claddings must comply with NZBC Acceptable Solution, 'E2/AS1' section 9.1.3.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled. Walls shall include those provisions as required by NZBC Acceptable Solution 'E2/AS1' 'External Moisture'. In addition all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashing for waterproofing. The other materials, components and installation methods used to manage

moisture in the walls, must comply with the requirements of relevant standards and the NZBC. For information in relation to designing for weathertightness, refer to the Building Research Association of New Zealand (BRANZ) and the Department of Building & Housing (DBH) updates on the following websites, respectively www.branz.co.nz and www.dbh.govt.nz.

2.6 STRUCTURE

Timber-framed buildings must be designed in accordance with NZS 3604 (Timber Framed Buildings). When the framing is provided as per the specific engineering design, the framing stiffness must be equivalent to or more than the stiffness requirements of NZS 3604.

2.7 WIND LOADING

Linea® Weatherboard cladding is suitable for use in all New Zealand wind zones up to and including VH as defined in NZS 3604. A specific design is required for all situations when a building falls in a specific design (SD) wind zone.

2.8 STRUCTURAL BRACING

Linea® Weatherboard installed as per Linea® Weatherboard specific bracing details will provide bracings for buildings designed and constructed in accordance with NZS 3604. The Linea® Weatherboard bracing systems have been independently tested and certified by BRANZ using both construction methods i.e. direct fixed and cavity construction. The following range of bracings can be achieved

- Wind 68 – 120BU'S
- Earthquake 60 – 105 BU'S

Refer to the James Hardie Bracing information manual for details.

2.9 FIRE RATED WALLS

Walls clad with Linea® Weatherboard using a direct fix or cavity construction method can achieve fire ratings of up to 60/60/60 when constructed in accordance with the James Hardie 'Fire and Acoustic' Technical Specification Manual.

Refer to Fire and Acoustic technical literature for further information about fire rated systems.

2.10 ENERGY EFFICIENCY

The R-Value of Linea® Weatherboard walls constructed in accordance with this manual using bulk insulation, will comply with the Section 3.1 - 'Schedule Method' of NZS 4218 (Energy Efficiency – Small Building Envelope) required under Table 1. To meet these insulation requirements, bulk insulation as mentioned in Table 1 of this specification must be used. This calculation is based on a timber framing member size of 90 x 45mm and internal linings of James Hardie Villaboard® Lining or plasterboard.

TABLE 1:

INSULATION CAPABILITY		
Climate Zone*	R-Value Requirement	Cavity Insulation Infill Requirement
1 & 2	1.5 m ² °C/W	R1.8 Fibreglass batts.
3	1.9 m ² °C/W	R2.2 Fibreglass batts.

*as defined in NZS4218

3 FRAMING

3.1 GENERAL

This Linea® Weatherboard technical specification is only suitable for timber-framed buildings. Other framing materials are outside the scope of this specification.

3.2 DIMENSIONS

A 35mm minimum stud width is required unless noted otherwise in this specification.

3.3 TIMBER GRADE

Minimum timber grade requirements are No.1 framing grade in accordance with NZS 3631 'New Zealand Timber Grading Rules' or equivalent.

3.4 DURABILITY

To comply with NZBC requirements the external framing must be treated to a minimum H1.2 treatment. Refer to NZBC Acceptable Solution B2/AS1 'Durability' for further information about the durability requirements. For timber treatment information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round and Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection.

Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers.

Note: refer to NZS 3602 for information about the allowable moisture content in timber.

3.5 FRAME CONSTRUCTION

All timber framing sizes and set-out must comply with NZS 3604 and stud, nogs / dwangs centres as required by this specification.

3.5.1 DIRECT FIXED CONSTRUCTION METHOD

The following framing must be provided for direct fixed construction method:

- Studs must be provided at 600mm centres maximum.
- Nogs must be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.5.2 CAVITY CONSTRUCTION METHOD

The following framing must be provided for cavity construction method:

- When studs are at 600mm centres the nogs must be provided at 800mm centres maximum.
- When studs are at 400mm centres the nogs may be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.6 TOLERANCES

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604. All framing must be made flush.

4 PREPARATION

4.1 BUILDING WRAP

Building wrap must be provided as per the requirements of NZBC Acceptable Solution 'E2/AS1' 'External Moisture' and NZS 3604. The building wrap must comply with Table 23 of 'E2/AS1'. The building wrap must be fixed in accordance with 'E2/AS1', NZS 3604 and the wrap manufacturer's recommendations. Walls which are not lined on the inside face e.g. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of NZBC Acceptable Solution 'E2/AS1'.

4.2 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to weatherboard installation. Please refer to moisture management requirements in Clause 2.5. The building wrap must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of building wrap. James Hardie will assume no responsibility for water infiltration within the wall due to poor installation of flashings or building wraps. The selected flashing materials must comply with the durability requirements of table 20 of Acceptable Solution 'E2/AS1'.

4.3 VENT STRIP

The James Hardie uPVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. James Hardie uPVC vent strip has an opening area of 1000mm²/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities.

4.4 CAVITY BATTENS

Buildings with a risk score of 13-20 calculated in accordance with NZBC Acceptable Solution 'E2/AS1' Table 2 require Linea® Weatherboards to be installed on a cavity.

The cavity battens provide airspace between the frame and cladding and are considered a "packer" only in this specification.

The timber battens must be minimum H3.1 treated in accordance with NZS 3640 (Chemical preservation of Round and sawn timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with 'E2/AS1' and:

- be minimum 18mm thick.
- be minimum as wide as the width of studs.
- be fixed by the cladding fixings to the main framing through the building wrap.
- until claddings are fixed the battens need only to be tacked to framing.

(Batten fixing is required temporarily to keep them straight on the wall during construction.)

The cavity battens are installed as described below:

- Fix cavity battens to studs.
- Battens should be fixed with 40mm x 2.8mm nails at 800mm centres maximum.

4.5 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the building wrap and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using a:

- Intermediate cavity batten between the studs.
- 75 mm galvanized mesh.
- polypropylene tape.

No intermediate supports are required:

- where studs are at 400mm centres. Or;
- when rigid sheathings instead of building wraps are used.

4.6 CORNERS

Anticipated joist shrinkage must be allowed for in the design process. Do not run trims or aluminium extrusions continuously across solid floor joists. There are a number of options to select from when detailing external corners:

- 90° corner soaker in aluminium, copper or stainless steel. Refer to Figures 7 and 32.
- Box corners using James Hardie Trim. Refer to Figures 3, 4 and 29.
- Mitred corners to weatherboards. Refer to Figures 5 and 30.
- Aluminium boxed corners. Refer to Figures 6 and 31.

There are a number of options to select from when detailing internal corners:

- Scribed corner. Refer to Figures 8 and 33.
- 90° or 135° Aluminium W-mould. Refer to Figures 9, 10, 34 and 35.

4.7 JUNCTIONS & PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea® Weatherboards which meet the requirements of E2 'External Moisture', an approved document of the NZBC. Refer to Figures 11 to 24 and 36 to 53.

5 FIXING LINEA® WEATHERBOARD

5.1 GENERAL

The horizontal lap of Linea® Weatherboards must be 30mm. Linea® Weatherboards must be kept dry and under cover whilst in storage prior to and during fixing. Cut ends which are exposed or where sealant is applied to the boards must be primed prior to installation. Dust and loose material must be removed before priming. An H3.1 treated timber cant strip must be provided to support the bottom board on the wall. Refer to Figure 1 and Figure 26.

5.2 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZ Building Code. NZS 3604 specifies the requirements for fixing's material to be used in relation to the exposure conditions and are summarized in Table 2.

TABLE 2:

EXPOSURE CONDITIONS & NAIL SELECTION PRESCRIBED BY NZS 3604

NAIL MATERIAL		
Sea Spray Zones *	Zone 1 outside sea spray zone and Zones 2 – 4 & Geothermal hot spots	Bracing – All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 Stainless

* (Zone 1 areas where local knowledge dictates that increased durability is required, appropriate selection shall be made)

Also refer to NZBC Acceptable Solution 'E2/AS1' Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 NAIL SIZE AND FIXING METHOD

Linea® Weatherboards and Trim must be fixed to timber with the types of nails specified in Tables 3 and 4, in accordance with the following requirements:

- All concealed nails must be driven flush with the board surface.
- When concealed fixing Linea® Weatherboards, nails must be driven behind the lap of the boards, except at all corners and vertical edges of openings where Linea® Weatherboards must be face fixed/exposed nailed. Ref Figure 2 and Figure 28.
- Nails must be fixed 25mm from the end of the board when hand nailing.
- Linea® Weatherboards may be face fixed when site conditions create a gap under the lap.

TABLE 3:

NAIL REQUIREMENTS FOR LINEA® WEATHERBOARDS

DIRECT TO STUD FIXING	
Concealed Nailing	
40 x 2.8mm HardiFlex® nails	Finish flush with the board surface
Face Nailing	
60 x 3.15mm jolt head nails	Hot-dipped galvanised may be driven through both thicknesses at board lap without pre-drilling Stainless steel jolt heads will require pre-drilling*

CAVITY FIXING	
Concealed Nailing	
60 x 3.15 mm HardiFlex® nails	Finish flush with the board surface.
Face Nailing	
75 x 3.15mm jolt head nails	Hot-dipped galvanised may be driven through both thicknesses at board lap without pre-drilling Stainless steel jolt heads will require pre-drilling*

* Use a 3.0mm drill bit

TABLE 4:

NAIL REQUIREMENTS FOR TRIM

Single Thickness	60 mm jolt head nails. If fixing over Linea® Weatherboard use predrilled* 75 x 3.15mm jolt head nails.
Double Thickness	60mm jolt head nails.
Single plus packer	If fixing over Linea® Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled* hole. When fixing to timber support use 60mm jolt head nails.

* Use a 3.0mm drill bit

Note: Special fixing arrangements are required for bracing and fire-resistance rated wall systems. For more information Ask James Hardie on 0800 808 868.

5.4 GUN NAILING

Linea® Weatherboard can also be gun-nailed when concealed fixing method is used.

- Gun-nailing must not be used when Linea® Weatherboard is used for bracing.
- Nails must be no closer than 50 mm from the ends of boards when gun nailing is used – double studs will be required.

6 JOINTING

The ends of Linea® Weatherboards are jointed off-stud by means of a tongue-and-groove (T&G) joint. T&G joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Sealant must be provided in the T&G joint.

7 FINISHING

Note: Protective coating of Linea® Weatherboard and Trim is required in order to meet the durability requirements of the New Zealand Building Code.

7.1 PREPARATION & PRIMING

The Linea® Weatherboard and Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade builders fill, allow to cure and sand smooth ready for priming. Prime the filled holes in accordance with paint manufacturer's specifications.

7.2 SEALANTS

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC and hold a current BRANZ Appraisal certificate. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 PAINTING

All Linea® Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat. Linea® Weatherboard must be painted within 90 days of installation. All exposed faces, including the top edges under the sills and bottom edges of Linea® Weatherboard, Trim and accessories must be finished with latex exterior paint system complying with any of parts 7, 8, 9, and 10 of AS 3730. Dark coloured paints can be used on Linea® Weatherboard and Trim. Some environments require special coatings. Paint selection and the preparation required is dependant on paint chosen. Refer to the paint manufacturer for information before starting painting.

8 STORAGE AND HANDLING

Linea® Weatherboards and Trim must be laid flat on a smooth level surface. To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards should become wet, allow to dry thoroughly before fixing. Do not carry weatherboards on the flat, carry in the vertical position to avoid excessive bending.

9 MAINTENANCE

It is the responsibility of the specifier to determine normal maintenance requirements to comply with NZBC Acceptable Solution B2/AS1. The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months*,
- Re-applying exterior protective finishes*,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants.
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation close to or touching the building.

**Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.*

10 PRODUCT INFORMATION

10.1 MANUFACTURING & CLASSIFICATION

James Hardie New Zealand is an ISO 9001(2000) Telarc certified manufacturer. Linea® Weatherboard and Trim are manufactured to meet the requirements of AS/NZS 2908.2: 2000 'Cellulose-Cement Products'. Linea® Weatherboard has a classification of Type A Category 3 in accordance with this Standard. Linea® Weatherboard is a reduced density cellulose cement formulation incorporating James Hardie patented CLD™ (Ceramic Low Density) technology. Linea® Weatherboard has a bevel back and tongue-and-groove (T&G) at the ends for jointing. The bottom front edge of Linea® Weatherboard is chamfered. The weatherboards are supplied pre-primed on their face and bottom edge with an acrylic primer. Linea® Weatherboards and Trim are identified by the printing at regular intervals of the name LINEA® on the back face.

10.2 JAMES HARDIE TRIM

The Trim, used for box corners, around windows and doors as well as special architectural features, is also made with the CLD™ technology and is supplied pre-primed with an acrylic primer.

10.3 DURABILITY

Linea® Weatherboard and Trim, when installed and maintained as per the technical specification, will meet the durability requirements for claddings as required in the NZBC Approved Document B2 'Durability'.

10.3.1 RESISTANCE TO MOISTURE/ROTTING

Linea® Weatherboard and Trim have demonstrated resistance to permanent moisture-induced deterioration (rotting) by passing the following tests in accordance with AS/NZS2908.2:

- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Heat Rain (Clause 6.5)
- Soak Dry (Clause 8.2.5).

10.3.2 RESISTANCE TO FIRE

Linea® Weatherboard and Trim has the following Early Fire Hazard Indices (tested to AS 1530 Part 3).

TABLE 5:

EARLY FIRE HAZARD INDICES	
Ignition Index	0
Flame Spread Index	0
Heat Evolved Index	0
Smoke Developed Index	0 -1

10.4 PRODUCT SIZES & MASS

Available sizes of Linea® Weatherboard and Trim and its weight are given in Table 6.

10.5 SIZE AND WEIGHT

Linea® Weatherboard is categorised as a Light Weight Wall Cladding as described in NZS 3604. Physical properties of Linea® Weatherboard and Trim are provided in Table 6.

11 SAFE WORKING PRACTICES

WARNING

DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'Score and Snap' knife, fibre cement shears or, where not feasible, use a HardiBlade® Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods - never dry sweep. For further information, refer to our installation instructions and Material Safety Data Sheets available at www.jameshardie.co.nz. FAILURE TO ADHERE TO OUR WARNINGS, MATERIAL SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

JAMES HARDIE RECOMMENDED SAFE WORKING PRACTICES

CUTTING OUTDOORS

- Position cutting station so that wind will blow dust away from user or others in working area.
- Use a dust reducing circular saw equipped with HardiBlade® Saw Blade and HEPA vacuum extraction.

DRILLING/OTHER MACHINING

When drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES:

1. NEVER use a power saw indoors
2. NEVER use a circular saw blade that does not carry the HardiBlade® logo
3. NEVER dry sweep – Use wet suppression or HEPA Vacuum
4. NEVER use grinders
5. ALWAYS follow tool manufacturer's safety recommendations

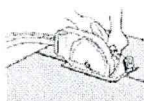
P1 or P2 respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

WORKING INSTRUCTIONS

Refer to Recommended Safe Working Practices before starting any cutting or machining of product.

HARDIBLADE® SAW BLADE

The HardiBlade® Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



HOLE-FORMING

For smooth clean cut circular holes:

Mark the centre of the hole on the sheet.

Pre-drill a 'pilot' hole.

Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

For irregular holes:

Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face.



Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.

STORAGE AND HANDLING

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping.

James Hardie building products must be installed in a dry state and be protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water or moisture, etc.

QUALITY

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

12 PRODUCT SIZES

TABLE 6:

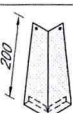
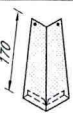
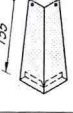
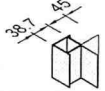
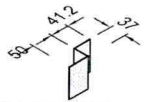
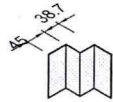
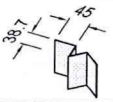
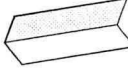
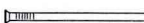
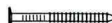
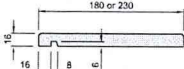
LINEA® WEATHERBOARD AND TRIM SIZES									
Product	Length (mm)	Width (mm)	Thickness (mm)	End Details	Effective Cover (mm)	COVERAGE INFORMATION			
						No. of planks/ metre height (approx.)	Mass kg/lineal m (approx. at EMC)	Mass kg/m ² approx. at EMC	weight/pack (60 units/ pack)
135 Linea® Weatherboard	4200*	135	16	T & G	105	9.5	2.62	24.93	660.00
150 Linea® Weatherboard	4200*	150	16	T & G	120	8.3	3.1	25.70	781.00
180 Linea® Weatherboard	4200*	180	16	T & G	150	6.7	3.57	23.92	899.00
84mm Linea® Trim	2600	84	16	Square	N/A	N/A	1.6	N/A	N/A
100mm Linea® Trim	2600	100	16	Square	N/A	N/A	1.9	N/A	N/A
135mm Linea® Trim	4200	135	16	T & G	N/A	N/A	2.6	N/A	N/A
180mm Linea® Trim	4200	180	16	T & G	N/A	N/A	3.4	N/A	N/A

*Length is 4200mm plus 5mm for the tongue and groove (T & G) making overall length 4205mm

*The effective thickness of finished Linea cladding on the wall at the lap is approximately 33 to 35mm

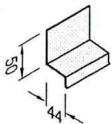
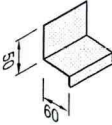
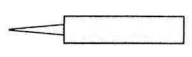
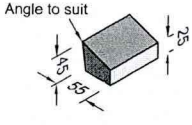
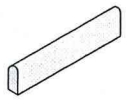
13 ACCESSORIES

ACCESSORIES/TOOLS SUPPLIED BY JAMES HARDIE

	ACCESSORY AND MATERIAL NUMBER	SIZE (MM)	MATERIAL / APPEARANCE
	External corner soaker 90° for 180 mm weatherboards - Aluminium 301186 - Copper 301188 - Stainless Steel 301197	200 long	Self colour
	External corner soaker 90° for 150 mm weatherboards - Aluminium 302820 - Stainless Steel 302821	170 long	Self colour
	External corner soaker 90° for 135 mm weatherboards - Aluminium 301185 - Copper 301187 - Stainless Steel 301196	155 long	Self colour
	External Slimline Box Corner Mould 301195	2700 long	Etch Primed Aluminium
	Box Corner 'Z' Flashing 301203	2700 long	PVC Grey
	Internal 'W' Mould 90° 301184	2700 long	Etch Primed Aluminium
	Internal 'W' Mould 135° 301183	2700 long	Etch Primed Aluminium
	Vent Strip 302490	3000 long	PVC White
	JH Corner Under Flashing 303745	3000 long	PVC White
	Jolt Head Nail 316 Stainless Steel 301233	60 x 3.15	Self colour
	Jolt Head Nail 316 Stainless Steel 301234	75 x 3.15	Self colour
	Inseal 3109 Sealing Strip 302324	5 x 3 x 25	Black compressible foam
	Trim 16mm 401943	84 x 2600 long	Fibre Cement primed
	Trim 16mm 401930	100 x 2600 long	Fibre Cement primed
	HardiFlex® nail - Jar - 5kg 302781 302782	60 x 3.15 ø x 6.8mmø head size	316 Stainless Steel
	HardiFlex® nail - Jar - 5kg 302783 302784	60 x 3.15 ø x 6.8mmø head size	Hot Dip Galvanised
	HardiBlade® Saw Blade 300660	4 tooth - 184mm	Diamond Tipped
	Fascia & Barge - 180mm - 230mm 401843 402230	4200 long	Fibre cement Primed
	Linea® and Fascia Screw 303480	40mm x 9 gauge	Stainless Steel

ACCESSORIES NOT SUPPLIED BY JAMES HARDIE

James Hardie recommends the following products for use in conjunction with its Linea® Weatherboard and Linea® Trim. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.

	ACCESSORY AND MATERIAL NUMBER	SIZE (MM)	MATERIAL / APPEARANCE
	Head Flashing for Direct Fixed without Linea® Trim facings	2700 long	Etch Primed Aluminium
	Head Flashing for Direct Fixed with Linea® Trim facings	2700 long	Etch Primed Aluminium
	HardiFlex® nail	40 x 2.8 ø	316 Stainless Steel
	HardiFlex® nail	40 x 2.8 ø	Hot Dip Galvanised
	Flexible Sealant or Expandable foam	Tube	Fosroc, Holdfast or similar
	PEF Rod	Polyethylene foam	Fosroc or similar
	Flashing Tape	Proprietary tape to adhere to building wrap	Tyvek, Protecto wrap or similar
	Flashing material as per table 20, 'E2/AS1'		Flashing Fabricator
	Jolt Head Nail - Hot Dip Galvanised or 316 Stainless Steel	50 x 2.8 St. Steel 50 x 2.8 Galvanised 60 x 3.15 Galvanised 75 x 3.15 Galvanised	Self colour
	Planted Sill	As shown	H3.1 Treated Timber Timber Merchant or cut on site
	Titanium Coated High Speed Drill Bit	3.0mm ø	
	Timber Scriber	As required	H3.1 Treated Timber Timber Merchant or cut on site
	Fibre Cement Cutting Blade	254mm	Diamond Tipped
	Fibre Cement Cutting Blade	305mm	Diamond Tipped

