

SPECIFICATION

of work shown on the accompanying drawings

~Proposed New Residence at:

(project name)

at

~Awamoa Road Oamaru

(project address)

for

~Erik & Beverly Badcock.

(owner's name)

Waitaki District Council

These plans approved for construction and must be kept on site.
Boundary pegs must be defined prior to building commencing.



Job number: ~

Date: ~December 2004.

CONTENTS

PROJECT INFORMATION

DRAWINGS

COMPLIANCE INFORMATION

PRODUCT INFORMATION

PROJECT SELECTIONS

GENERAL

11 GENERAL REQUIREMENTS

SITE

22 PREPARATION

STRUCTURE

31 CONCRETE

33 CONCRETE MASONRY

34 CARPENTRY

ENCLOSURE

41 WALL CLADDING

42 ROOFING

43 MEMBRANE ROOFING

45 ALUMINIUM WINDOWS AND DOORS

46 GLAZING

LINING

51 INTERNAL LININGS

52 FITTINGS

FINISH

61 SOLID PLASTER

63 PAINTING AND PAPERHANGING

SERVICES

71 WATER

72 GAS

73 RAINWATER SYSTEM

74 SANITARY PLUMBING

75 DRAINAGE

76 ELECTRICAL

ADDITIONAL ITEMS

REFERENCES

ADDENDA

Note: The standard text in the technical sections of this specification may have been customised to suit the project being specified.

<u>Owner</u>	Name:	~Erik & Beverly Badcock
	Mailing address:	~
	Phone/fax:	~
<u>Contractor</u>	Name:	~Rodger Gilchrist Building Services.
	Mailing address:	~
	Phone/fax:	~
<u>Designer</u>	Name:	~ Rodger Gilchrist Building Services.
	Mailing address:	~
	Phone/fax:	~
<u>Project location</u>	Street address:	~Awamoa Road Oamaru.
	Legal description:	Lot ~ C.T. ~
<u>Project description</u>	Type:	~Proposed New Residence (addition/internal alteration/demolition)
	Intended use:	single residential building
	Intended life:	Indefinite but not less than 50 years or specified as: ~ years

DRAWINGS

<u>Drawing number</u>	<u>Drawing Title</u>
~	

COMPLIANCE INFORMATION

SITE DATA

Soil type (NZS 3604, clause 3.2)	~
Exposure/corrosion zone (NZS 3604, figures 4.1, 4.2)	~
Wind region (NZS 3604, figure 5.1)	~
Topographical class (NZS 3604, tables 5.3, 5.4)	~
Wind zone (NZS 3604, tables 5.1 and 5.2)	~High Wind Zone
Earthquake zone (NZS 3604, figure 5.4)	~

BUILDING DATA

Building classification (NZS 3604, table 1.1)	~
Floor live load (NZS 3604, table 1.2)	~1.5 KPa
Overall height of building	~ metres

PRODUCT INFORMATION

Producer Statements	~
BIA Accreditations	~
BRANZ Appraisals	~

PROJECT SELECTIONS

22 PREPARATION

Granular base: ~
Backfill: ~

31 CONCRETE

DPC – brand/type: ~*approved proprietary*
Concrete: ~ *20.0MPa*
Surface finish: ~*smooth float finish*
Insulation – brand/thickness: ~*confirm with client.*

33 CONCRETE MASONRY

Masonry - type: ~*firth masonry*
Pointing - form: ~
Liquid applied tanking:
- brand/type: ~
Sheet DPC – brand/type: ~*approved proprietary*

34 CARPENTRY

Framing timber:
- timber type/treatment: ~*90x45mm H3.1 framing.*
Finishing timber:
- timber type/treatment: ~
Building wrap - brand/type: ~*Approved high wind zone proprietary.*
Plywood sarking/bracing:
- thickness: ~*7.5 mm*
- brand/type treatment/grade: ~*H3 origin.*
Flooring - brand/type/thickness: ~*20mm Origin*
Decking – type/thickness: ~ *17.5mm Origin*
Insulation (brand/type/R value):
- floor: ~*confirm with client*
- walls: ~*R2.4*
- ceiling: ~*R 3.2*

41 WALL CLADDING

Building wrap - brand/type: ~*Tyvek weatherisation system or similar Hardies approved system*
Underlay - brand/type: ~*approved proprietary*
Main cladding:
- brand/type: ~*Hardies Linear 180 weather board.*
- material/thickness/treatment: ~
- finish: ~*Manufacturer approved Paint finish*
Fixings: metal and frequency to suit cladding, wind zone and exposure zone
Fixings – type/metal/finish: ~*as per Hardies Specs.*
Jointers – type/material/finish: ~ *as per Hardies Specs.*
Trims – type/material/finish: ~ *as per Hardies Specs.*
Soffit cladding:
- brand/type material thickness: ~*4.5 mm Hardiflex*
- finish: ~*Paint.*

42 ROOFING

Underlay - brand/type: *~Tasman Insulation Flamestop 660.*

Roofing:

- type/brand/profile/material: *~Approved manufacturer.*

- thickness: *~ 0.55mm*

- finish: *~colorsteel Gz2*

Fixings: metal and frequency to suit roofing, wind zone and exposure zone

Fixings – type/metal/finish: *~ per manufacturers specifications*

Trims/flashings:

- type/material/finish: *~ colorsteel Gz2*

Penetration flashing:

- metal/sealant: *~As per manufacturers specifications*

Flashings- metal/finish: *~Colorsteel Gz2*

43 MEMBRANE ROOFING

Underlay - brand/type: *~Ardex Butynol*

Roofing:

- brand/type/thickness: *~1.5 mm*

- coating type: *~*

45 ALUMINIUM WINDOWS AND DOORS

Brand: *~Approved manufacturer*

Finish - brand/type: *~Powder coated aluminium.*

51 INTERNAL LININGS

Standard plasterboard brand/thickness/finish level:

- walls: *~10mm Gib Board*

- ceilings: *~13mm Gib Board*

Special plasterboard brand/type/thickness/finish level:

Bracing - walls: *~10mmBrace Line*

Bracing - ceilings: *~*

Wet area - walls: *~10mm Gib Aqua Line or 6mm Villa Board.*

Wet area - ceilings: *~13mm Gib Aqua Line or 6mm Villa Board.*

Finishings - material/dimensions:

- skirtings: *~ confirm with client*

- trim: *~ confirm with client*

61 SOLID PLASTER

Plaster – finish/thickness *~4 - 6mm plaster render over concrete block*

Backing material - rigid: *~90 series concrete block veneer*

73 RAINWATER SYSTEM

Spoutings:

- brand type/size material: *~approved manufacturer*

- finish: *~Colorsteel Gz2*

Downpipes:

- type/size material finish: *~Colorsteel Gz2*

Sealant – brand/type *~manufacturer approved.*

11 GENERAL REQUIREMENTS

11.1 THE WORKS

The works are as described in this specification and shown on the drawings.

11.2 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.

Contractor: The person contracted by the owner to carry out the contract.

11.3 THE SITE

The site of the works, the site address and the legal description are listed under PROJECT INFORMATION. Confine access and work to the area of site indicated on the drawings.

11.4 SPECIFICATION SECTIONS

Sections are for reference and convenience only and do not constitute individual trade sections or work elements. Read all sections together and read 11 GENERAL REQUIREMENTS with all other sections.

11.5 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.
Approval:	Approval in writing.
Direction:	Direction in writing.
Notified:	Notified in writing.

11.6 INCONSISTENCIES

If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.

11.7 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 owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions. Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified.

11.8 THE WORDS "PROVIDE" OR "FIX"

The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.

11.9 MANUFACTURERS AND SUPPLIERS

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

11.10 REFERENCED DOCUMENTS

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 1991. Reference is also made to various Standards produced by Standards New Zealand (NZS, NZMP, AS/NZS) 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. Documents cited both directly and within other cited publications are part of this specification.

11.11 PRECEDENCE OF REFERENCED DOCUMENTS

This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where building consent approval is affected, the change notified to the territorial authority.

11.12 BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 1991 to carry out any work not in accordance with the building consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where building consent approval is affected refer any change to the territorial authority.

11.13 STATUTORY OBLIGATIONS

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

11.14 BUILDING CONSENT

Obtain the original or copies of the building consent form and documents from the owner and keep on site. Liaise with the territorial authority and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

11.15 INSPECTIONS

Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the territorial authority inspector.

11.16 PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Provide producer statements in the form required by the Building Act 1991.

11.17 TRADE GUARANTEES AND WARRANTIES

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

- 11.18 **SITE ACCOMMODATION**
Provide, erect and maintain scaffolding, sheds, toilets, water, power and hoardings. Allow for cartage, craneage, plant hire and storage. Arrange for temporary works and services necessary for the completion of the works.
- 11.19 **HEALTH AND SAFETY**
Make the works safe and 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.
- 11.20 **PROTECT THE WORKS**
Protect parts of the work liable to damage until completion of the works. 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.
- 11.21 **STORAGE AND PROTECTION**
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 manufacturers requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.
- 11.22 **ANTIQUITIES AND ITEMS OF VALUE AND INTEREST**
Report immediately the finding of any fossils, antiquities, or objects of value. Ensure they remain undisturbed until approval is given for their removal.
- 11.23 **MEANS OF COMMUNICATION**
All directions and approvals in writing.
- 11.24 **PROGRAMME**
Provide a programme for the contract works, including the work of separate contractors being carried out concurrent with this contract. Form of programme: A dated bar chart, identifying the contract work's critical path and all key dates for the provision of labour, materials and elements. Supply a copy of the programme, and any updates to the owner.
- 11.25 **WORKING HOURS**
Work on site is restricted to 8.00am to 6.00pm, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by the owner.
- 11.26 **RESTRICTIONS**
Do not:
 - smoke on site
 - light rubbish fires on the site
 - bring dogs on to or near the site
 - bring radios/audio players on to the site.
- 11.27 **QUALITY ASSURANCE**
Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.
- 11.28 **DAMAGE AND NUISANCE**
Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the territorial authority and relevant Acts and Standards.
- 11.29 **SET OUT AND DATUM**
Set out the works to conform with the drawings. Establish a permanent site datum to confirm the existing ground floor level and its relationship to other existing and new building levels.
- 11.30 **EXECUTION OF THE WORK**
Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.
- 11.31 **MATERIALS AND PRODUCTS**
Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.
- 11.32 **COMPATIBILITY**
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.
- 11.33 **COMPLETE ALL SERVICES**
Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.
- 11.34 **CLEAR AWAY**
Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.
- 11.35 **CLEAN**
Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.

22 PREPARATION

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

22.1 SITE SAFETY

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

22.2 FILLING MATERIALS

As selected and to the following details:

Volcanic tuff:	Scoriaceous tuff of variable grading excluding silt or clay material, capable of being placed and compacted as specified.
Rock fill:	Hard material comprising rock, broken stone, hard brick, concrete, run of pit scoria, or other comparable inert material capable of being placed and compacted as specified.
Sand fill:	Clean sand of such grading in particle size as to allow for mechanical compaction to 90% maximum density.
Hardcore:	Scoria or crushed rock to GAP (General All Passing) 40 grading.
Granular base:	Screened crushed gravel or scoria graded in size from 20 mm to 7 mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.
Dressing course:	Scoria to GAP 20 grading, or "dirty footpath scoria", or equivalent "all in" graded crushed metal aggregate.
Free-draining aggregate:	Scoria or crushed gravel graded 50 to 14 clean.

22.3 EXCAVATION GUIDELINES

Carry out excavation to the guidelines set by the Occupational Safety and Health Service (OSH) publication: "Approved Code of Practice for Safety in Excavation and Shafts for Foundations".

22.4 PROTECT EXISTING

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

22.5 PROTECT TREES

Protect from damage all trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained, throughout the course of the work.

22.6 SURFACE PREPARATION

Conforming with NZS 3604, section 3.5, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.

22.7 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove underground elements and redundant services. Report for instructions when unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.

22.8 STOCKPILE TOPSOIL

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

22.9 GENERAL EXCAVATION

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

22.10 EXCAVATION FOR FOUNDATIONS

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

22.11 INADEQUATE BEARING

If bearing is inadequate then excavate further and backfill with material as follows:

Below slabs on grade:	Hardfill
Below footings:	10 MPa concrete
Service trenches:	Hardfill

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

22.12 GRANULAR BASE FOR SLABS

To NZS 3604, section 7.5.3. Consolidate with a vibrating roller. Blind the surface with coarse sand or sand/cement and roll ready to receive a dampproof membrane.

22.13 GENERAL BACKFILLING

Compact backfilling in 150 mm layers, with the last 200 mm in clean topsoil, lightly compacted and neatly finished off.

31 CONCRETE

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 31.1 REINFORCEMENT
Bars to NZS 3402, grade 300 deformed. Welded reinforcing mesh to AS/NZS 4671. Mild drawn steel tying wire not less than 1.2 mm diameter.
- 31.2 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.
- 31.3 CONCRETE
Strength as selected. Ready-mix ordinary grade, maximum aggregate size 19 mm. Site mixed ordinary grade, using either separate batching of sand and coarse aggregate, or builder's mix.
- 31.4 HANDLE AND STORE REINFORCING
Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean and free of contamination that may reduce bonding capacity.
- 31.5 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.
- 31.6 CUT AND BEND
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars without written approval. Bend main reinforcing bars, stirrups and ties to the former pin diameters as given in NZS 3109, table 3.1.
- 31.7 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.
- 31.8 LAPPED SPLICES
Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109, clause 3.7. Increase laps of plain round steel by 100%.
- 31.9 COVER
Minimum cover to reinforcing as shown on the drawings and to NZS 3109, clause 3.8. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, clause 3.9.
- 31.10 SURFACE FINISHES
To comply with NZS 3114, section 105, or as denoted on the drawings. Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Surface tolerances to comply with NZS 3114, sections 104 and clause 105.3.2.
- 31.11 DAMPPROOF MEMBRANE
Apply 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.
- 31.12 CASTING IN
Build in grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required. Form pockets, chases and flashing grooves as required. No grounds exceeding 100 mm in length. Minimum cover on conduits 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. Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion.
- 31.13 CONSTRUCT FLOOR SLABS
Construct in accordance with NZS 3604, section 7.5. 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 the requirements of NZS 3109.
- 31.14 SAW CUTS
Pour floor slabs cast on the ground in areas no greater than 25 square metres, with a maximum ratio of length to breadth of 1:1.5. 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: 1/3rd slab depth, or 30 mm minimum.
- 31.15 SURFACE REPAIRS
Make good surface defects as soon as forms are stripped. Make good hollows or bony areas with 1:2 mortar, finished to the same tolerances as the parent concrete. Fill tie rod holes with 1:2 mortar.
- 31.16 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.

- 31.17 STRIKE FORMWORK
Strike formwork without damaging or overloading structure.
- 31.18 CLEAN OUT
Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

33 CONCRETE MASONRY

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 33.1 QUALIFICATIONS
Carry out masonry work with people competent and experienced, under the supervision of a registered mason.
- 33.2 INSPECTION
Call for inspection of the work at critical stages including set out, reinforcing, and the time prior to and during grouting. All as set out in NZS 4210, section 3.3.2.
- 33.3 TESTS AND RECORDS
Carry out required tests in accordance with NZS 4210, appendix 2A. Keep accurate records relating to strength and quality of materials used in the construction, and make the information available to the territorial authority inspector on request.
- 33.4 MASONRY UNITS
As selected.
- 33.5 ACCESSORIES
Reinforcement: To NZS 3109.
Mortar: Sand to NZS 3103. Chloride levels not exceeding 0.04% by dry weight of sand. Mortar to NZS 4210, section 2.2. Compressive strength of not less than 12.5 MPa.
Grout: To NZS 4210, section 2.3. Spread value 450-530 mm.
Water: From local authority supply.
- 33.6 STORAGE
Store masonry clear of the ground, under cover and well ventilated until placed in the work. Ensure masonry units are air dry prior to laying.
- 33.7 CHECK BASE CONCRETE
Ensure the base concrete is true to line and level, requiring a base mortar bed of 10 mm (minimum) to 20 mm (maximum).
- 33.8 STARTER POSITIONS
Before commencing masonry laying check the location of starter reinforcement by measure or by a dry trial lay up of the first course. Do not correct misplacement by cranking bars; obtain direction.
- 33.9 INSTALL REINFORCEMENT
Detailed, bent and placed in accordance with NZS 4210. Refer to drawings for details of reinforcement and extent of grout filling. Minimum cover as required for reinforced concrete, with grout and masonry work treated as a homogeneous material. Maintain reinforcing bars for retaining walls a minimum of 15 mm and for other blockwork a minimum of 6 mm, from the blockwork face, with the space filled with grout.
- 33.10 TOLERANCES
Construct within the tolerances set out in NZS 4210, clauses 2.6.5 and 2.7.1. Lay masonry units with bedding of consistent thickness throughout.
- 33.11 LAY MASONRY UNITS
Execution generally to NZS 4210 and NZS 4229. Ensure consistent, fully filled and tooled joints. Where walls are reinforced, prevent mortar droppings from entering the cells being grouted. Provide clean out holes at base of wall, unless "low lift" (NZS 4210) grouting is used. Ensure reinforcement is accurately placed and tied. Lay in regular running bond with all necessary special units and sill units. Cut masonry, if necessary, true and square without chipping.
- 33.12 PROTECTION
Protect fair-faced masonry walls, keeping them clear of mortar droppings, grout splashes, or stains.
- 33.13 MASONRY JOINTS
Not exceeding 10 mm thick, or less than 8 mm when the masonry units are bedded in. Joints tooled concave.
- 33.14 CONTROL JOINTS
Locate at major changes of wall height or thickness, at openings, and at not more than 8 metre centres, or, as shown on the drawings.
- 33.15 BRACING
Provide sufficient temporary lateral bracing to ensure stability until the final construction is in place.
- 33.16 GROUTING OF CELLS
Inspect walls prior to grouting. Ensure cells are clean and reinforcement is correctly placed. Grout all masonry cells below finished grades, all cells in retaining walls and all cells containing reinforcing. Use procedures set out in NZS 4210.

33.17 CONSTRUCTION JOINTS

Form and treat construction joints between grout pours and between block walls and hardened concrete work to ensure bonding occurs. Comply with NZS 4210, section 2.16.

33.18 BUILD IN

Mortar in components such as sills, copings, lintels, and steps, as work proceeds. Build in plugs, bolts, ties, metal flashings, dowels, fastenings and fixings as required and as shown on the drawings.

33.19 CLEANING

Clean off mortar splashes and grout spills as they occur, making good any damage at the same time. Clean down masonry and remove waste material from adjoining surfaces and floors.

34 CARPENTRY

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

34.1 TIMBER FRAMING GENERALLY

Species, grade and level of treatment as selected and as set out in NZS 3602. Grading to NZS 3631 and treated to NZMP 3640. Mechanical stress grading acceptable as an alternative to visual grading.

34.2 TIMBER FRAMING DRY, CHEMICAL FREE, MECHANICALLY STRESS GRADED

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

34.3 TIMBER FRAMING DRY, TREATED

Species, grade and moisture content in service as selected and as set out in NZS 3602. Treated H1 to NZMP 3640, with an average moisture content at supply of 16% or less. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.

34.5 FLOORING AND DECKING

As selected and to the following details:

Plywood: Structural plywood for bracing, bracketing, sarking and floors.

34.6 FINISHING TIMBER

As selected.

34.7 INSULATION

As selected.

34.8 ACCESSORIES

Building wrap:	Breather type, waterproof.
Damp proof course:	2-ply/3-ply kraft felt strip saturated and coated with bitumen.
Nails, bolts and screws:	Steel, stainless steel, galvanised steel of pattern to suit the location and to BRANZ Bulletin 328 "Selection and use of fasteners". To NZS 3604, section 4 for durability.
Nail plates connectors:	Stainless steel and/or galvanised steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604, section 4 for durability. Galvanised steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604, section 4 for durability.

34.9 ATTENDANCE

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

34.10 MOISTURE CONTENT

Maximum allowable moisture content in accordance with NZS 3602 for framing supporting interior linings:

- Framing at erection	24%
- Framing at enclosure	20%
- Framing at lining	16%

34.11 EXECUTION GENERALLY

To NZS 3604 except as varied in this specification. 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). Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings.

34.13 INSTALL FLOOR, WALL AND ROOF FRAMING

Floors and bottom plates framed and fastened to NZS 3604, section 7. Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8. Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins to NZS 3604, section 10. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9 and 10.

34.14 INSTALL BATTENS

Fabricate and fasten wall battens to suit the selected wall cladding or lining. Fasten ceiling battens in accordance with NZS 3604, section 13.

34.16 INSTALL INSULATION

Fit insulation as detailed, to the insulation manufacturer's requirements, and to the requirements of BRANZ Bulletin 357 "Thermal insulation of houses".

4. SCHEDULES

4.2 FLOOR FRAMING

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Mid floor joists:	Radiata pine structural grades	H1.1
	Radiata pine kiln dried and gauged	None
	Douglas fir structural grades	None
Boundary joists:	Radiata pine structural grades	H1.2
	Douglas fir structural grades	H1.2

4.3 EXTERIOR WALL FRAMING

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Exterior walls:	Radiata pine structural grades	H1.2
	Douglas fir structural grades	H1.2
Parapets:	Radiata pine structural grades	H1.2
	Douglas fir structural grades	H1.2
Enclosed decks and balconies:	Radiata pine structural grades	H3.1

4.4 ROOF FRAMING

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Rafters:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None
Trusses:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None
Purlins:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None
Ceiling joists:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None
Valley boards:	Radiata pine merchantable grade	H3.1
Sarking:	Radiata pine merchantable grade	H3.1
Skillion roof framing:	Radiata pine structural grades	H1.2
Enclosed flat roof framing:	Radiata pine structural grades	H3.1

4.6 EXTERIOR EXPOSED TIMBERS

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Posts:	Radiata pine structural grades	H3.2
Joists:	Radiata pine structural grades	H3.2
Softwood decking:	Radiata pine structural grades	H3.2
Hardwood decking:	~	
Exterior stairs and steps:	Radiata pine structural grades	H3.2
Pergola:	Radiata pine structural grades	H3.2

4.7 EXTERIOR FINISHING TIMBERS

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Weatherboards:	Radiata pine dressing grade	H3.1
Fascia/barge/cover boards:	Radiata pine dressing grade	H3.1
Exterior trim:	Radiata pine dressing grade	H3.1

4.11 INTERIOR FRAMING

<u>Member</u>	<u>Timber species and grade</u>	<u>Treatment</u>
Non structural walls:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None

Structural and braced walls:	Radiata pine structural grades	H1.1
	Douglas fir structural grades	None
	Radiata pine kiln dried and gauged	None

4.15 INTERIOR FINISHING TIMBERS

<u>Member</u>	<u>Timber species and grade</u>
Architraves:	Radiata pine dressing grade
Skirtings:	Radiata pine dressing grade
Cornices:	Radiata pine dressing grade

41 WALL CLADDING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 41.2 PLYWOOD
Structural plywood to AS/NZS 2269.
- 41.3 TIMBER WEATHERBOARD
As selected, or radiata pine to NZS 3631 for grading, NZS 3602 for selection and NZMP 3640 for treatment.
- 41.5 FIBRE CEMENT SOFFIT LINING
Cellulose cement autoclaved sheets.
- 41.6 TIMBER FASCIAS AND BARGE BOARDS
As selected, or radiata pine to NZS 3631 for grading, NZS 3602 for selection and NZMP 3640 for treatment.
- 41.7 EXTERIOR FINISHING TIMBER
As selected.
- 41.8 ACCESSORIES
As selected and to the following details:
 Building wrap: Breather type, waterproof.
 PVC jointers: To suit sheet thickness.
 Nails, screws, fastenings: Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability.
- 41.9 METAL FLASHINGS
As selected.
- 41.10 MOISTURE CONTENT
Maximum allowable moisture content in accordance with NZS 3602.
- 41.11 EXECUTION GENERALLY
To NZS 3604 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
- 41.12 INSTALL WALL WRAP
Fix wall wrap as detailed and to the cladding manufacturer's requirements.
- 41.14 INSTALL PLYWOOD
Install to the plywood manufacturer's requirements. Refer to the plywood manufacturer's literature for fixing details, NZS 3604 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.
- 41.15 PRIME OR SEAL
Prime (for opaque finish) or seal (for clear finish) front and back faces, edges and end grain (minimum 2 coats) before fixing weatherboards and exterior trim.
- 41.16 INSTALL TIMBER WEATHERBOARDS
Install level, true to line and face, to NZBC acceptable solution E2/AS1, 2.1, and to NZS 3604, section 11.5.2. Refer to NZS 3604 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.
- 41.18 INSTALL FIBRE CEMENT SOFFITS
Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and capping moulds. Refer to the cladding manufacturer's literature for fixing details, NZS 3604 for fixings durability requirements and to BRANZ Bulletin 326 "Cladding buildings on exposed sites" for specific provisions.
- 41.19 INSTALL EXTERIOR TIMBER FINISHINGS
Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.
- 41.20 INSTALL FLASHINGS
Install flashings, covers and soakers as detailed on the drawings and to BRANZ Bulletins 304 "Flashing design" and 305 "Domestic flashing installation".

Job Details

Name	Erik & Beverley Badcock.
Street and Number	Awamoa Road
Lot and DP Number	Lot 4 DP 321410
City/Town/District	Oamaru
Designer and date	Rodger Gilchrist building Services. 15-12-04

Building Specification

Location of Storey	single	▼	
Floor Loading	2 kPa	▼	
Foundation Type	slab	▼	
Building Height to Apex (m)	7	▼	
Roof Height above Eaves (m)	3	▼	
Stud Height (m)	2.4	▼	
Cladding Weight (top or single)	heavy	▼	
Cladding Weight (lower)	heavy	▼	not applicable (single storey building)
Cladding Weight (subfloor)	heavy	▼	not applicable (slab)
Roof Weight	light	▼	
Roof Pitch (degrees)	25-45	▼	
Room in Roof Space	yes	▼	
Building Length (m)	25		Use roof length including eaves
Building Width (m)	14.5		Use roof length including eaves
Gross Building Plan Area (m2)	195		

Building Location

Wind Zone	High	Earthquake Zone
Region	R1 ▼	B ▼
Terrain	Inland ▼	
Exposure	Exposed ▼	
Topography	Moderate ▼	

Bracing Units required for Wind

per m	subfloor	walls
W along	n/a	78 BUs/m
W across	n/a	78 BUs/m
Totals		
W along	n/a	1131 BUs
W across	n/a	1950 BUs

Bracing Units required for Earthquake

per m2	subfloor	walls
E	n/a	7.2 BUs/m2
Totals		
E along	n/a	1404 BUs
E across	n/a	1404 BUs

V1.2A

Along									
Wall or Bracing Line		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5		6	7	8W	9EQ
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type		Element Length L (m)	Element Height H (m)	BUs Achieved	BUs Achieved
A	220	1	origin	sp 2	▼	0.6	2.4	51	51
		2	Gib®	BR9	▼	0.8	2.4	88	76
		3	Gib®	BR9	▼	0.8	2.4	88	76
line totals		4	origin	sp1	▼	0.9	2.4	90	90
W	437	5	origin	sp1	▼	1.2	2.4	120	120
EQ	413	6		none	▼		2.4		
B	70	1	origin	sp1	▼	1.2	2.4	120	120
		2	Gib®	Gib1b	▼	2.4	2.4	180	120
		3	Gib®	Gib1b	▼	3.6	2.4	270	180
line totals		4	Gib®	Gib1a	▼	1.8	2.4	99	90
W	669	5		none	▼		2.4		
EQ	510	6		none	▼		2.4		
C	200	1	origin	sp 2	▼	0.6	2.4	51	51
		2	origin	sp1	▼	1.2	2.4	120	120
		3	origin	sp1	▼	1.2	2.4	120	120
line totals		4	origin	sp1	▼	1.2	2.4	120	120
W	411	5		none	▼		2.4		
EQ	411	6		none	▼		2.4		
D	70	1	origin	sp 2	▼	0.6	2.4	51	51
		2	origin	sp 2	▼	0.6	2.4	51	51
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W	102	5		none	▼		2.4		
EQ	102	6		none	▼		2.4		
E	enter	1		none	▼		2.4		
		2		none	▼		2.4		
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W		5		none	▼		2.4		
EQ		6		none	▼		2.4		
								Wind	Earthq.
Totals Achieved								1619	1436
								OK	OK
Totals Required (from Sheet A)								1131	1404

V1.2A

Wind	Earthq.
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

OK OK

1950	1404
------	------

Gib® Bracing Systems (1999)

For details see Gib® Bracing Systems, 1999
and appropriate manufacturer's literature

[illegible]

Job Details

Name	Erik & Beverley Badcock.
Street and Number	Awamoa Road
Lot and DP Number	Lot 4 DP 321410
City/Town/District	Oamaru
Designer and date	Rodger Gilchrist building Services. 15-12-04

Building Specification

Location of Storey	upper	▼	
Floor Loading	2 kPa	▼	
Foundation Type	slab	▼	
Building Height to Apex (m)	7	▼	
Roof Height above Eaves (m)	2	▼	
Stud Height (m)	2.4	▼	
Cladding Weight (top or single)	light	▼	
Cladding Weight (lower)	heavy	▼	
Cladding Weight (subfloor)	heavy	▼	not applicable (slab)
Roof Weight	light	▼	
Roof Pitch (degrees)	25-45	▼	
Room in Roof Space	no	▼	
Building Length (m)	9.8		Use roof length including eaves
Building Width (m)	6.1		Use roof length including eaves
Gross Building Plan Area (m2)	42		

Building Location

Wind Zone	High	Earthquake Zone
Region	R1 ▼	B ▼
Terrain	Inland ▼	
Exposure	Exposed ▼	
Topography	Moderate ▼	

Bracing Units required for Wind

per m	subfloor	walls
W along	n/a	64 BUs/m
W across	n/a	54 BUs/m
Totals	subfloor	walls
W along	n/a	390 BUs
W across	n/a	529 BUs

Bracing Units required for Earthquake

per m2	subfloor	walls
E	n/a	5.0 BUs/m2
Totals	subfloor	walls
E along	n/a	210 BUs
E across	n/a	210 BUs

Gib® Wall Bracing Calculation Sheet B

upper of two

V1.2A

Along									
Wall or Bracing Line	Bracing Elements provided							Wind	Earthq.
1	2	3	4	5	6	7	8W	9EQ	
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	BUs Achieved	BUs Achieved	
A	100	1	Gib®	BR9	▼	0.8	2.4	88	76
		2	Gib®	BR9	▼	0.8	2.4	88	76
		3	Gib®	Gib1b	▼	2.4	2.4	180	120
line totals		4		none	▼		2.4		
W	356	5		none	▼		2.4		
EQ	272	6		none	▼		2.4		
B	100	1	Gib®	BR5	▼	1.5	2.4	173	128
		2	Gib®	BR5	▼	1.5	2.4	173	128
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W	345	5		none	▼		2.4		
EQ	255	6		none	▼		2.4		
C		1		none	▼		2.4		
		2		none	▼		2.4		
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W		5		none	▼		2.4		
EQ		6		none	▼		2.4		
D		1		none	▼		2.4		
		2		none	▼		2.4		
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W		5		none	▼		2.4		
EQ		6		none	▼		2.4		
E		1		none	▼		2.4		
		2		none	▼		2.4		
		3		none	▼		2.4		
line totals		4		none	▼		2.4		
W		5		none	▼		2.4		
EQ		6		none	▼		2.4		
							Wind	Earthq.	
Totals Achieved							701	527	
							OK	OK	
Totals Required (from Sheet A)							390	210	

V1.2A

Across									
Wall or Bracing Line		Bracing Elements provided						Wind	Earthq.
1	2	3	4	5	6	7	8W	9EQ	
Line Label	Minimum BUs Req/Ach	Bracing Element No.	Supplier	Bracing Type	Element Length L (m)	Element Height H (m)	BUs Achieved	BUs Achieved	
M	50	1	Gib®	BR9	0.8	2.4	88	76	
		2	Gib®	BR9	0.8	2.4	88	76	
		3		none		2.4			
line totals		4		none		2.4			
W	176	5		none		2.4			
EQ	152	6		none		2.4			
N	70	1	Gib®	BR4	1.1	2.4	110	94	
		2	Gib®	BR5	1.5	2.4	173	128	
		3		none		2.4			
line totals		4		none		2.4			
W	283	5		none		2.4			
EQ	221	6		none		2.4			
O	50	1	Gib®	BR5	1.8	2.4	207	153	
		2	Gib®	BR5	1.8	2.4	207	153	
		3		none		2.4			
line totals		4		none		2.4			
W	414	5		none		2.4			
EQ	306	6		none		2.4			
P		1		none		2.4			
		2		none		2.4			
		3		none		2.4			
line totals		4		none		2.4			
W		5		none		2.4			
EQ		6		none		2.4			
Q		1		none		2.4			
		2		none		2.4			
		3		none		2.4			
line totals		4		none		2.4			
W		5		none		2.4			
EQ		6		none		2.4			
								Wind	Earthq.
Totals Achieved							873	679	
								OK	OK
Totals Required (from Sheet A)							529	210	

Gib® Bracing Systems (1999)

*For details see Gib® Bracing Systems, 1999
and appropriate manufacturer's literature*

[illegible]

- 41.21 **USE OF SEALANTS**
Selection and use of sealants to follow BRANZ Bulletin 284 "Sealed joints in external claddings - 2. Sealants".
- 41.22 **COMPLETE**
Complete all flashings, finishings and trim so the cladding system is completely weathertight.

42 ROOFING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 42.1 **QUALIFICATIONS**
Use experienced, competent roofers familiar with the materials and techniques specified.
- 42.2 **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 and confirmed under COMPLIANCE INFORMATION.
- 42.3 **PROFILED METAL**
Profile, metal and finish as selected. Accessories, cappings, flashings and fixings to match and to the roofing manufacturer's requirements.
- 42.6 **ACCESSORIES**
- | | |
|----------------------------|---|
| Tile battens: | Douglas fir, or No 1 framing radiata pine to NZS 3602. Sized to NZS 3604, section 10. Treated hazard class H1. |
| Roof underlays: | As selected. |
| Nails, screws, fastenings: | Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability. |
| Flashings: | As selected. |
- 42.7 **STORAGE**
Stack roofing and accessories on clean, level areas of the site. Cover and protect from damage and from weather until ready to fix in place.
- 42.8 **SET OUT**
Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features. Overlaps to face away from prevailing wind direction.
- 42.9 **LAY ROOF UNDERLAY**
Lay and fix to NZBC acceptable solution E2/AS1, NZS 3604, section 11.2.2.
- 42.10 **TAKE CARE**
Take care to avoid damaging pre-finished roofing both during and after fixing. Mark only with chalk or spirit-based pen. Wear only soft-soled shoes on the finished surface. Remove metal filings daily.
- 42.11 **INSTALL PROFILED METAL**
Use cutting tools recommended by the roofing manufacturer. Fold ends and seal cut edges to the roofing manufacturer's requirements. Fix complete with matching accessories, flashed to roof features and penetrations; all in accordance with the New Zealand Metal Roofing and Cladding Manufacturers' Association Inc. publication "Profiled metal roofing design and installation handbook".
- 42.16 **FIXINGS AND SEALANTS**
Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.
- 42.17 **INSTALL COVERS AND FLASHINGS**
Provide apron, verge and ridge flashings. Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC acceptable solution E2/AS1, 1.0.
- 42.18 **PENETRATIONS**
Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.
- 42.19 **COMPLETE**
Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.
- 42.20 **CLEAR**
Clear trade debris 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.

43 MEMBRANE ROOFING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 43.1 **QUALIFICATIONS**
Use only experienced roofers, licensed and recommended by the membrane system manufacturer.
- 43.2 **MEMBRANE ROOFING SHEET**
As selected.

- 43.3 ACCESSORIES
- Tapes: Lap and moulding tapes to the roofing manufacturer's requirements for each location.
- Galvanised clouts: As supplied and required by the roofing manufacturer.
- Edge trim: To the roofing manufacturer's details for the specific location.
- Outlets: As supplied and required by the roofing manufacturer.
- Cappings and flashings: As detailed and as required by the roofing manufacturer.
- Fixings: Adhesives, primers, sealants and solvents compatible with the membrane and approved by the roofing manufacturer.
- 43.4 SURFACE COATING
As selected.
- 43.5 ROOFING GENERALLY
All work and materials to the membrane roofing manufacturer's requirements and complying with the relevant requirements of BRANZ publication: "Good Membrane Roofing Practice".
- 43.6 STORAGE
Take delivery of sheet in packs/rolls undamaged and allow for site handling facilities where required. Stack off the ground on a level surface and with accessories secured against damage.
- 43.7 WEATHER
Apply in dry atmospheric conditions and only when the temperature is above 8 degrees centigrade.
- 43.8 PRELIMINARY WORK
Before laying ensure all preliminary work, including surface finish, formation of falls, provision of suitable flashing chases and fillets, fixing of vents and roof outlets to correct levels, is complete and formed to allow the system to work as intended.
- 43.9 CONCRETE SUBSTRATE
Prepare surface, including vacuum cleaning and acid etching as necessary to leave the surface smooth, clean, dry and free of all debris.
- 43.10 PLYWOOD SUBSTRATE
Confirm that sheets have been screw fixed, are rigid, with joints flush, no loose or protruding fixings, no lumps or hollows, smooth, clean, dry and free of all debris.
- 43.11 LAYING MEMBRANE ROOFING
Ensure substrate condition and preparation, materials, accessories, fixing and laying methods are in accordance with the roofing manufacturer's specifications, details and applicator requirements.
- 43.12 FINISH AT PENETRATIONS
Form and finish to all upstands, downturns, penetrations, sumps and vents as detailed and to the roofing manufacturer's requirements.
- 43.13 SEAL PENETRATIONS
Seal, flash and overflash all penetrations through the roof as detailed and to the roofing manufacturer's requirements.
- 43.14 EXPANSION JOINTS
Finish and seal all expansion, contraction, construction and control joints as detailed and to the roofing manufacturer's requirements.
- 43.15 PROTECT FINISHED SURFACE
Wear only soft-soled shoes on the finished roof surface. Do not place any materials on, or support any ladders or scaffolding off, the finished surface.
- 43.16 COMPLETE SURFACE COATING
Ensure the surface coating system is approved as compatible by the manufacturer of the membrane roofing system. Complete in accordance with the coating manufacturer's requirements.
- 43.17 INSPECT
Inspect and test all joints on completion.
- 43.18 FLOOD TEST
Flood test horizontal applications with a minimum of 50 mm depth of water for 24 hours. Make good any lack of watertightness after the roof surface is completely dry.

45 ALUMINIUM WINDOWS AND DOORS

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 45.1 CERTIFICATION
Provide a certificate from a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the performance requirements of NZS 4211 and the listed project site data. Fabrication by a member of the Window Association of New Zealand.
- 45.2 WINDOWS AND DOORS
Brand, finish and type as selected.
- 45.3 WINDOW AND DOOR REVEALS
As selected.

- 45.4 GLASS
As selected, with glass details to 45 GLAZING and complying with NZS 4223.
- 45.5 FLASHINGS
As selected.
- 45.6 ORGANIC POWDER COATING FINISH
To the Window Association of New Zealand's "Specification for powder coatings on architectural aluminium products". All finished surfaces to show uniformity of gloss and colour (to match sample) free of all coating defects.
- 45.7 HARDWARE
As selected.
- 45.8 SEALANT, GLAZING TAPE AND GASKETS
To the window manufacturer's requirements.
- 45.9 FIXINGS
Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.
- 45.10 OPENING PREPARATION
Obtain confirmation of all framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Prepare and trim to WANZ WIS™ Pre Cladding Trim Preparation requirements.
- 45.11 EXECUTION GENERALLY
To NZS 4211, WANZ "Aluminium Window Handbook" and "Installation code for aluminium joinery products". Install to WANZ WIS™ Window installation System requirements.
- 45.12 HANDLING
Avoid distortion of elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.
- 45.13 CORROSION PROTECTION
Seal or suitably coat cut ends and holes drilled in aluminium before the frames are installed. Before fixing, apply bituminous coatings, slips or underlays between dissimilar metals in contact, or aluminium in contact with concrete.
- 45.14 FIX FRAMES
Fix frames rigidly in place without distortion, to the window manufacturer's and the Window Association of New Zealand's "Aluminium Window Handbook" requirements, plumb, true to line and face, weathertight and with all openings operating freely.
- 45.15 DRAINAGE
Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.
- 45.16 GLAZING INSTALLATION
All glass held in aluminium beads and black PVC gaskets.
- 45.17 SAFETY GLASS INSTALLATION
Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223, part 3, as modified by NZBC acceptable solution F2/AS1.
- 45.18 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 on head flashings to match window finish.
- 45.19 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.
- 45.20 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. Permanent manifestations to comply with NZS 4223, part 3, 303.1.
- 45.21 CLEAN GLASS AND FRAMES
Clean off or remove glass indicators at completion of the building. Clean glass inside and out to a shining finish. Clean down both sides of window and door frames using the methods required by the window and door manufacturer.

46 GLAZING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 46.1 GLAZING TAPE
Pressure sensitive, self-adhesive vinyl foam tapes, selected to suit the glazing detail.
- 46.2 GLASS THICKNESS
As selected and to NZS 4223, parts 1 and 3.

- 46.3 **FLOAT GLASS**
To NZS 4223, part 1, clause 101.2.2.2: Glazing quality (selection G). Thickness as required by NZS 4223, part 1.
- 46.4 **PATTERNED GLASS**
Translucent, annealed, rolled glass with a decorative pattern on one surface.
- 46.5 **LAMINATED GLASS**
Grade A safety glazing material with PVB or CIP resin interlayer.
- 46.6 **TOUGHENED GLASS**
Grade A safety glazing material.
- 46.7 **SOLAR FLOAT GLASS**
Float glass, body-tinted or reflective coated glazing.
- 46.8 **PUTTY, TIMBER FRAME**
Linseed oil based, knife grade putty.
- 46.9 **SETTING BLOCKS**
Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, at the base of glass panes.
- 46.10 **SPRIGS**
Diamond metal pieces to retain glass in timber sashes and frames.
- 46.11 **MIRROR GLASS**
Float plate mirror glass to NZS 4223, part 1, clause 101.2.2.2: Silvering quality (selection S), with silver and copper plating and 2 coats of protective paint.
- 46.12 **MIRROR ADHESIVE**
Use both mirror-mastic adhesive and double-sided adhesive tape.
- 46.13 **EXECUTION GENERALLY**
To NZS 4223, part 1, and for human impact safety glazing to NZS 4223, part 3.
- 46.14 **INSTALL GLASS, EXTERIOR TIMBER WINDOWS**
Prime, clear seal rebates and beads, back-putty, sprig in glass and neatly complete putty fronting. Glass thickness and perimeter clearances to NZS 4223, part 1.
- 46.15 **INSTALL GLASS, EXTERIOR TIMBER DOORS**
Remove temporarily pinned beads; prime, clear seal rebates and beads, back putty, sprig in glass, front putty and neatly replace beads.
- 46.16 **INSTALL GLASS, INTERIOR TIMBER WINDOWS AND DOORS**
Remove temporarily pinned beads; fit tape, set glass on plastic distance pieces and refit beads.
- 46.17 **SAFETY GLASS INSTALLATION**
Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223, part 3, as modified by NZBC acceptable solution F2/AS1.
- 46.18 **MIRRORS, SCREW FIXED**
Fix with proprietary zinc-plated steel countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.
- 46.19 **MIRRORS, CHANNEL MOUNTED**
Fix with proprietary mounting channels, to the channel manufacturer's requirements.
- 46.20 **MIRRORS, ADHESIVE FIXED**
Fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive mastic area 0.25 square metres per 1 square metre of mirror.
- 46.21 **INSTALL MIRROR DE-MISTER**
Installed to the de-mister manufacturer's requirements.
- 46.22 **PRIME PUTTY**
Prime all exposed putty within 21 days of completing glazing.
- 46.23 **SAFETY**
Indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type. Do not apply indicators other than whiting to the glass surface. Permanent manifestations to comply with NZS 4223, part 3, 303.1.
- 46.24 **CLEAN**
Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

51 INTERNAL LININGS

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 51.1 **FRAMING MOISTURE CONTENT**
Maximum allowable moisture content in accordance with NZS 3602.
- 51.2 **PROTECT**
Protect joinery, fittings and finishes already in place from water staining or damage from lining installation. Ensure building is weatherproof before lining work commences.

- 51.3 **PLASTERBOARD**
As selected. Gypsum plaster core encased in a durable face and backing paper formed for standard use, bracing use, fire rated use and water resistance use.
- 51.4 **GALVANISED STEEL CEILING BATTENS**
As selected.
- 51.5 **PLASTERBOARD ACCESSORIES**
 External angles: Slim type 0.5 mm galvanised steel.
 Casing bead: Slim type 0.5 mm galvanised steel or PVC.
 Cornice: Plasterboard scotia type.
 Nails: Galvanised clouts 40 mm x 2.5 mm.
 Screws: 40 mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws
 Jointing compound and paper tape: To the board manufacturer's requirements.
 Adhesive: Multi-purpose water based wallboard adhesive.
- 51.6 **TIMBER BOARDING**
As selected and to NZS 3602.
- 51.11 **NAILS**
Zinc-plated steel, stainless steel and galvanised steel of pattern to suit location and to BRANZ Bulletin 328 "Selection and use of fasteners".
- 51.12 **INTERIOR FINISHING TRIM**
Timber selection to NZS 3602. Profile as detailed, or to match existing. Jointer profiles to suit location.
- 51.13 **SUBSTRATE**
To NZS 3604, sections 8, 10, 12, 13 and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.
- 51.14 **CONFIRM LEVELS OF FINISH**
Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained. Provide levels of finish as laid down in AS/NZS 2589.1.
- 51.15 **LINE PLASTERBOARD CEILINGS AND WALLS**
Line ceilings with plasterboard sheets, fastened to the plasterboard manufacturer's requirements. Line walls that are up to 2400 mm high by the horizontal method and walls above 2400 mm high by the vertical method, with plasterboard sheets.
- 51.16 **SPECIAL PLASTERBOARD LININGS**
Line wet area walls with water resistant plasterboard sheets using adhesive and nail fixing to studs at centres to suit the surface finish. Form bracing panels using high density plasterboard sheets fixed with clout-washers and clouts and to conform with NZS 3604, sections 5.8 and 13.5. Form sound rated panels following the sheet manufacturer's specifications and details for the required sound rating. Form fire rated panels following the sheet manufacturer's specifications and details for the required fire rating.
- 51.17 **FIX PLASTERBOARD EXTERNAL ANGLES**
Fix full length to external corners, with clouts at 100 mm each side staggered.
- 51.18 **FIX PLASTERBOARD CORNICE**
Fix with adhesive and with joints scribe-fitted to the plasterboard manufacturer's requirements.
- 51.19 **PLASTERBOARD JOINTING AND STOPPING**
Fill joint recess with bedding compound, centre the paper tape, apply second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. Fill nail holes and flush up external angles with two successive coats of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. All to the plasterboard manufacturer's requirements.
- 51.20 **LEVELS OF FINISH**
Provide levels of finish to standards laid down by AS/NZS 2589.1 as follows:
 Level 4: surfaces receiving light texture or wall covering finishes
 Level 5: surfaces receiving thin coating finishes.
- 51.24 **INSTALL TRIM**
Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber beads to wall/ceiling junctions.

61 SOLID PLASTER

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

61.1 QUALIFICATIONS

Carry out solid plaster work using competent, experienced plasterers.

61.2 MATERIALS

Sand: To BRANZ "Good Stucco Practice" 7.2.3.
Cement: Portland cement to NZS 4251, part 1, clause 2.2.2.3.
Water: From local town supply.
Lime putty: To BRANZ "Good Stucco Practice" and NZS 4251, part 1.
Admixtures: Strictly in accordance with the admixture manufacturer's requirements.

61.3 PLASTER MIX

(C = cement; L = lime; S = sand)

On concrete/concrete block

<u>Finish</u>		<u>Thickness</u>
Bond coat	1 : 1.5 CS	} Combined bond and flanking coats } 15 mm (minimum) 12 mm on concrete block } Finish coat 3 mm (maximum)
Flanking coat	1 : 1 : 6 CLS	
Finish coat - sponge	1 : 1 : 6 CLS	
<u>Rigid or non-rigid backing on steel or timber framing</u>		
Bond coat	1 : 1 : 6 CLS or 1 : 0.5 : 4.5 CLS	} } Combined bond and flanking } coats 18 mm (minimum) }
Flanking coat	1 : 1 : 6 CLS or 1 : 0.5 : 4.5 CLS	
Finish coat - sponge	1 : 2 : 9 CLS 1 : 0.25 : 3.5 CLS	

61.4 STORAGE

Store materials on site in conditions ensuring protection from contamination and deterioration.

61.5 BACKGROUND STANDARD

Ensure that backgrounds and adjoining surfaces are (with the preparation called for) of a standard required for plastering. Protect existing adjoining work and surrounding areas with boards, dust sheets and protective panels. Completely mask metals, joinery, glass and other adjoining finished surfaces. Ensure flashings and penetrations are in place, and work liable to damage the plaster complete before commencing laying up.

61.6 PREPARATION OF SOLID BACKGROUND

Hack off projections, fill voids. Remove oils, retarders, loose material and leave surfaces dust free. Roughen concrete to provide a mechanical bond, rake out concrete block joints and dampen surface if necessary before applying the bond coat.

61.12 PLASTERING

Lay up all coats to the requirements of NZS 4251, part 1 and BRANZ "Good Stucco Practice", under atmospheric conditions that will not adversely affect the finished work. Scratch the initial coats of plaster to provide a mechanical key for following coats. Complete any coat in sufficient time to enable subsequent coats to be applied under conditions that give full bond. Cut out damaged and faulty work in any coat and make good before proceeding.

61.13 ACCURACY

For trowelled surfaces no deviation more than 3 mm from a 1200 mm long straight edge. For textured surfaces no deviation more than 3 mm from a 900 mm long straight edge.

61.14 PROVIDE CONTROL JOINTS

When not detailed, provide control joints at 4 metre centres maximum vertically and horizontally; vertically at all openings and horizontally at inter-storey level at the underside of the floor construction.

61.15 CURING

Wet cure unmodified plaster by continuous mist spray or protect with wet hessian for 4 days and then slowly dry for 3 days. Wet cure acrylic-modified plaster for 1 day and shade for another 4 days. Protect finished work from the weather and from damage by building operations or other causes.

63 PAINTING AND PAPERHANGING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 63.1 QUALIFICATIONS
Carry out work using competent and experienced painters and paperhangers.
- 63.2 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 or sanding off paint, or using solvent based paint removers.
- 63.3 PAINT
As selected and to the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.
- 63.4 GAP FILLERS
Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.
- 63.5 INSPECT SURFACES
Inspect surfaces being painted 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.
- 63.6 PROTECT
Cover up adjoining surfaces and areas liable to damage or over-painting.
- 63.7 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.
- 63.8 PRIMING AND SEALING
Ensure that priming and sealing work needed before or during construction is carried out when required.
- 63.9 ENVIRONMENTAL CONDITIONS
Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.
- 63.10 SELECTIONS
Confirm all selections, colours and finishes for both paint and wallpaper with the owner.
- 63.11 SHARP EDGES, CRACKS AND HOLES
Repair as required by the paint manufacturer.
- 63.12 PREPARE SURFACES
Prepare surfaces as required by the paint manufacturer. Make good all damage and defects.
- 63.13 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.
- 63.14 MANUFACTURER'S MANUALS
Refer to the paint manufacturers' 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.
- 63.15 SCUFF BETWEEN COATS
Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.
- 63.16 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.
- 63.17 CONFIRM WALLPAPER BATCH
Confirm that all rolls of each pattern are from the same batch.
- 63.18 WALLPAPER INSTALLATION
Seal or size walls. Drops full-length, completely glued, pattern matched and hung vertically without bubbles or visible butt joints. Scribe cut paper 2 mm onto surrounding trim.
- 63.19 CLEAN
Clean adjoining surfaces, glass and fittings of any paint contamination.
- 63.20 REPLACE
Replace hardware without damage to the hardware or the adjoining surfaces.

71 WATER

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 71.1 QUALIFICATIONS
Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.
- 71.4 POLYETHYLENE WATER PIPE
Proprietary high-density cross-linked polyethylene composite pipe and fittings.
- 71.5 INSULATION FOR HOT WATER PIPES
As selected.
- 71.6 EXPOSED PIPES
As selected and to the following details:
- chrome plated copper pipe with chrome plated brass nuts and fittings
- white polyethylene composite pipe with white nuts and accessories
- pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings.
- 71.7 GATE VALVES
De-zincified brass with screwed ends.
- 71.9 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE
Copper thermal storage cylinder insulated and complete with pressure reducing valve and fittings required for installation by the manufacturer.
- 71.11 VALVES, TAPS AND FAUCETS
As selected.
- 71.12 ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 71.13 EXECUTION GENERALLY
Generally carry out the whole of this work and tests to NZBC acceptable solution G12/AS1.
- 71.15 INSTALL 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 fixing, and jointed to the pipe manufacturer's specifications, all to NZBC acceptable solution G12/AS1. Conceal pipework and pressure test before wall linings are fixed.
- 71.16 OUTLET LOCATIONS
Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.
- 71.17 INSTALL HOT WATER PIPE INSULATION
Insulate hot water pipes in accordance with 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 galvanised steel wire ties.
- 71.18 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 acceptable solution G12/AS1, 6.10.
- 71.19 PENETRATIONS
Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.
- 71.20 INSTALL TAPS AND FAUCETS
Install taps and faucets in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.
- 71.21 COMPLETION
Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

72 GAS

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 72.1 REGULATIONS
Comply with the Gas Regulations, Electricity Regulations and other network utility operator's requirements. Give notices for inspections and carry out tests as required.
- 72.2 QUALIFICATIONS
Gasfitters to be experienced competent craftsman gasfitters, or registered gasfitters working under the direction of a craftsman gasfitter, familiar with the materials and techniques specified.
- 72.3 CERTIFICATION CERTIFICATE
Provide a Gasfitting Certification Certificate as required by Regulation 24 of the Gas Regulations 1993.
- 72.4 PIPING DESIGN
Design the piping system with pipe sizes to give a minimum pressure at any appliance inlet of 1.13 kPa for natural gas, when all appliances are in use; and with a maximum design pressure drop from meter outlet to any appliance of 80 Pa. All to NZS 5261.

- 72.5 **PRESSURE TEST**
Pressure test the system for leakage to NZS 5261 before pipework is concealed by linings.
- 72.6 **FINAL INSPECTION AND TEST**
Submit the work for inspection and test and prove to the satisfaction of the gas retailer that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.
- 72.7 **COPPER PIPE**
Complete with fittings to NZS 3501.
- 72.8 **POLYETHYLENE PIPE**
To NZS 7646 and complete with fittings to NZS 5261.
- 72.9 **EXECUTION GENERALLY**
Carry out the whole of this work to the requirements of NZBC acceptable solution G10/AS1 and NZS 5261.
- 72.10 **INSTALL PIPING**
Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to NZS 5261. Confirm the type of pipe to be used and its location.
- 72.11 **INSTALL GAS APPLIANCES**
Fit and connect the gas appliances to NZS 5261, complete with flues where required and to the appliance manufacturer's requirements.
- 72.13 **COMPLETION**
Leave the installation including appliances clean and in full working order.

73 RAINWATER SYSTEM

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 73.7 **ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING**
Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.
- 73.8 **ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES**
Seam jointed and complete with stand-off brackets, galvanised screw fixed.
- 73.12 **RAINWATER HEADS, DROPPERS, OVERFLOWS**
Fabricate and install as detailed.
- 73.13 **FLASHINGS GENERALLY**
Aluminium/zinc coated steel, copperised pure lead, 0.5 mm copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 304 "Flashing design".
- 73.14 **ACCESSORIES**
Domes: Wire mesh in round form with legs to clip inside the outlet opening to the downpipe
Spouting mesh: Flexible plastic mesh.
Sealants: As selected.
- 73.15 **ELECTROLYTIC ACTION**
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 73.16 **LIAISON**
Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.
- 73.19 **INSTALL ALUMINIUM/ZINC ALLOY COATED STEEL PRE-PAINTED SPOUTING AND DOWNPIPES**
Screw fix brackets, set to falls to outlets, with spouting joints silicone sealed and pop-riveted to the spouting manufacturer's requirements. Screw fix stand off brackets, set pipes plumb and clear of the wall, with joints silicone sealed. Discharge into stormwater bends.
- 73.21 **INSTALL 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, allow for 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 305 "Domestic flashing installation".
- 73.22 **INSTALL DOMES**
Install wire mesh domes at the top of downpipes.
- 73.23 **INSTALL SPOUTING MESH**
Install mesh into spoutings, strictly in accordance with the mesh manufacturer's requirements.
- 73.24 **ENSURE**
Ensure rainwater services are operational, flashings complete and the building weathertight.

74 SANITARY PLUMBING

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 74.1 QUALIFICATIONS
Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.
- 74.3 UPVC WASTE, SOIL AND VENT PIPES
UPVC pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.
- 74.4 EXPOSED PIPES AND TRAPS
As selected and to the following details:
- chrome plate on copper pipes and associated copper and brass fittings
- white polybutylene or PVC, including all associated fittings.
- 74.5 SANITARY FIXTURES
As selected.
- 74.6 SANITARY ACCESSORIES
As selected.
- 74.7 EXECUTION GENERALLY
Carry out this work and complete all tests to AS/NZS 3500.2.2.
- 74.8 ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.
- 74.9 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.
- 74.10 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 3500.2.2. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to roof vents and vermin proof mesh to untrapped waste pipes.
- 74.11 PENETRATIONS
At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.
- 74.12 INSTALL SANITARY ACCESSORIES
Install the selected sanitary accessories.
- 74.13 TEST
Test soil and waste disposal systems to ensure no leakage exists and leave in working order.
- 74.14 ENSURE
Ensure all sanitary plumbing fittings and pipework are complete and operational.

75 DRAINAGE

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 75.1 QUALIFICATIONS
Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 1976.
- 75.2 MATERIALS
- | | |
|-----------------------------------|--|
| Concrete: | 17.5 MPa ordinary grade. |
| Reinforcement: | Grade 300 deformed bars. |
| Ceramic pipes: | As selected. |
| uPVC pipes: | uPVC pipes bends, junctions, fittings and joints. |
| Field drains: | Plastic pipes for field drains perforated and coiled with filter fabric over. |
| <u>Drainage/filling materials</u> | |
| Granular fill: | Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm. |
| Selected fill: | Fine grain soil or granular material suitable for bedding, excluding topsoil. |
| Ordinary fill: | Top soil or other excavated materials. |
- 75.3 FITTINGS
- | | |
|------------------------------|---|
| Gully traps: | To NZBC acceptable solution G13/AS2, 3.3, complete with grating. |
| Surface water sump gratings: | Cast iron frame with lift-up grating. |
| Strip drain channel: | Proprietary, modular, variable invert, uPVC or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings. |
| Inspection covers: | Cast iron frame with screw-down cover. |
- 75.4 EXCAVATE
Excavate for drains to a firm even base with correct gradients set in straight runs.

- 75.5 **MANUFACTURER'S REQUIREMENTS**
All drainage installations to the pipe and fitting manufacturer's requirements.
- 75.6 **EXCAVATION GENERALLY**
Carry out drainage work to AS/NZS 3500.2.2 (foul water) and AS/NZS 3500.3.2 (stormwater) as modified by NZBC acceptable solution B1/AS1, 6.0.
- 75.7 **LAY FOUL WATER DRAINS**
Lay drains in straight runs to correct gradients, to discharge into the network utility operators sewer. Set inspection fittings on a concrete base.
- 75.8 **INSTALL GULLY TRAPS**
Set on concrete 50 mm above surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.
- 75.9 **LAY STORMWATER DRAINS**
Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in 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.
- 75.10 **LAY SUBSOIL DRAINS**
Lay perforated coil piping firmly in a granular bed in straight runs to correct gradients, discharging into a sump. Carry the granular bed up over the pipes without disturbing them, to a total depth of 300 mm and cover with geotextile fabric; all to the pipe manufacturer's requirements.
- 75.13 **INSTALL INSPECTION CHAMBERS**
Stormwater: To NZBC acceptable solution E1/AS1, with channels to form a cascade where necessary and with a 75 mm fall across the chamber.
Foul water: To NZBC acceptable solution G13/AS2, with ceramic channels with a 75 mm fall across the chamber.
Form channel top 100 mm above pipe soffit. Bench from channel with 17.5 MPa concrete to form a smooth finish. Fit a cast iron cover and frame.
- 75.14 **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.
- 75.15 **FIELD TEST**
Field test drains for watertightness to the satisfaction of the territorial authority inspector.
- 75.16 **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.
- 75.17 **AS-BUILT DRAWINGS**
Supply a 1:100 as-built drawing to the territorial authority and the owner on completion.

76 ELECTRICAL

Refer to PROJECT SELECTIONS for specific product, material, accessories and finish selections.

- 76.1 **COMPLY**
Comply with the Electricity Regulations 1997, AS/NZS 3000 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.
- 76.2 **QUALIFICATIONS**
Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations 1997.
- 76.3 **CERTIFICATE OF COMPLIANCE**
Supply a certificate of compliance to the owner, as required by the Electricity Regulations 1997. Allow the network utility operator to view before the meter installation, listed work inspection, polarity check and livening of supply.
- 76.4 **DISTRIBUTION BOARD / SUB BOARD**
Proprietary manufactured, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB's, RCD's and main switch. All protective devices: 6kA MCB's of the appropriate rating. Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure is maintained.

- 76.5 CABLES
Tough plastic sheathed copper conductors. Minimum sizes are indicated below. Increase these as necessary due to method of installation, cable length or load.
Lighting circuits: 1.5 mm² on 16 amp MCBs.
Power circuits: 1.5 mm² on 16 amp MCBs for domestic construction
Power circuits: 2.5 mm² on 16 amp MCBs for domestic insulated construction
- 76.6 ELECTRICAL ACCESSORIES
As selected and to the following details:
Wall boxes: Standard size in plastic, with 2 or more gang size in metal, all screw fixed.
Switch units: 16 amp, 230 volt flush polycarbonate units. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2-way units refer to the electrical drawings.
Hot water system switch: One way 20 amp switch complete with clamp for flexible PVC conduit.
Switched socket units: 10 amp, 230 volt flush polycarbonate 3 pin combined switch units.
Ceiling roses: White plastic mounting base with screwed cover. Terminal type.
Batten holders: Standard white plastic bayonet cap, with cap angled where wall mounted.
Brass liners.
- 76.7 LIGHT FITTINGS
As selected.
- 76.8 ELECTRIC-POWERED FITTINGS AND EQUIPMENT
As selected.
- 76.9 CABLING
Install with a maximum of 10 light outlet units or 6 switched socket units on any circuit. Separate circuits for all electric heating appliances. 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.
- 76.10 INSTALL SWITCH AND SOCKET UNITS
Fit single and double switch units and socket units level and plumb where shown on the drawings. Install 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 switches vertically and socket units horizontally. Label switch units which control electrical equipment by engraving on the rocker switch.
- 76.11 INSTALL LIGHT FITTINGS
Install selected light fittings in the locations and heights shown on the drawings and in accordance with the fitting manufacturer's requirements.
- 76.12 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.
- 76.13 GAS HOT WATER SYSTEM
Wire for control system to continuous flow gas hot water system.
- 76.14 UNDERFLOOR HEATING SYSTEMS
Connect under floor heating systems complete with thermostats to manufacturers requirements.
- 76.15 WIRE FOR PLUMBING FITTINGS
Wire for fittings to the Electricity Regulations 1997 and to the fitting manufacturer's requirements.
- 76.16 INSTALL SMOKE DETECTORS
Install detectors to the detectors to NZBC acceptable solution F7/AS1 Domestic smoke alarms and to manufacturer's requirements, fitted neatly and without damage to the surrounding finish.
- 76.17 ELECTRIC POWERED FITTINGS AND EQUIPMENT
Install and wire selected fittings and equipment to the Electricity Regulations 1997 and the individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment.
- 76.18 COMPLETION
Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.

REFERENCES

Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.

Acts and Regulations

Building Act 1991

Health and Safety in Employment Act 1992

Plumbers, Gasfitters and Drainlayers Act 1976

Gas Regulations 1993

Electricity Regulations 1997

New Zealand Electrical Codes of Practice (ECP)

New Zealand Building Code verification methods

E2/VM1 External moisture

New Zealand Building Code acceptable solutions

B1/AS1 Structure - general

D1/AS1 Access routes

E1/AS1 Surface water

E2/AS1 External moisture

F2/AS1 Hazardous building materials

F7/AS1 Domestic smoke alarms

G10/AS1 Piped services - gas

G12/AS1 Water supplies

G13/AS2 Foul Water – drainage

New Zealand Standards

AS/NZS 1758 Mechanically stress-graded timber

AS/NZS 2269 Plywood - Structural

AS/NZS 2589 Gypsum linings in residential and light commercial construction

2589.1 Gypsum plasterboard

AS/NZS 2699 Built-in components for masonry construction

2699.1: Wall ties

AS/NZS 3000 Electrical Regulations - Buildings, structures and premises

NZS 3103 Sands for mortars and plasters

NZS 3104 Specification for concrete production

NZS 3109 Concrete construction

NZS 3114 Concrete surface finishes

AS/NZS 4671 Steel reinforcing materials

NZS 3422 Welded steel fabric of drawn steel wire for concrete reinforcement

AS/NZS 3500 Plumbing and drainage

Part 2 Sanitary plumbing and drainage

Part 3 Stormwater drainage

NZS 3501 Specification for copper tubes for water, gas and sanitation

NZS 3602 Timber and wood-based products for use in building

NZS 3604 Timber framed buildings

NZS 3631 New Zealand national timber grading rules

NZS 4210 Masonry construction materials and workmanship

NZS 4223 Glazing in buildings

Part 1: The selection and installation of glass in buildings

Part 3: Human impact safety requirements

NZS 4229 Concrete masonry buildings not requiring specific design

NZS 4251 Solid plastering

Part 1: Cement plasters for walls, ceilings and soffits

NZS 4357 Structural laminated veneer lumber

NZS 5261 Installation of gas burning appliances and equipment

NZS 7646 Polyethylene pipes and fittings for gas reticulation

NZS 6803 Acoustics - Construction noise

Building Research Association of New Zealand (BRANZ)

Good practice guide: Stucco

Good practice guide: Tiling

Good practice guide: Membrane roofing

Bulletin 304: Flashing design

Bulletin 314: Removing paint coatings from houses

Bulletin 328: Selection and use of fasteners

Bulletin 357: Thermal insulation of houses

Bulletin 407: Walls on exposed sites

Bulletin 436: Masonry veneer construction

Bulletin 441: Sealed joints in external claddings - 2. Sealants

Bulletin 448: Domestic flashing installation

Department of Labour – Occupational Safety and Health (OSH)

OSH Publication: Approved code of practice for demolition

OSH Publication: Approved code of practice for safety in excavation and shafts for foundations

OSH Publication: Guidelines for the management and removal of asbestos

New Zealand Metal Roofing Manufacturers Inc

NZ Metal roofing and wall cladding: Code of practice

Window Association of New Zealand Incorporated (WANZ)

Aluminium Window Handbook

Specification for powder coatings on architectural aluminium products

Installation code for aluminium joinery products

WIS™ Window Installation System