SPECIFICATION

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

PROPOSED DWELLING

30 KOREKE LOOP, LAKE HAWEA WANAKA

ADOLPH/HUGGINS

Job Number: 26-158

Date: OCT 2026

2201 PREPARATION AND GROUNDWORK

1. GENERAL

1.1 DOCUMENTS
Documents referred to in this section are:

NZS 3604	Timber framed buildings
OSH	Approved code of practice for safety in excavation and shafts for foundations

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

1.3 ANTIQUITIES AND ITEMS OF VALUE
Report the finding of any fossils, antiquities and other items of value. All to remain undisturbed until approval is given for removal, and all remain the property of the owner.

2. PRODUCTS

2.1 EXCAVATED FILL
Material from other formations in the excavation which may be selected and approved as suitable for filling by having grading and moisture content properties that will allow recompaction to 95% of maximum density.

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

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

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

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

2.8 FREE-DRAINING AGGREGATE
Scoria or crushed gravel graded 50 to 14 clean.

3. EXECUTION

3.1 EXCAVATION GENERALLY
Carry out excavation to the guidelines set by the OSH publication: Approved code of practice for safety in excavation and shafts for foundations.

3.2 BURNING OF MATERIALS
Burning of materials is not permitted on site.

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

3.4 PROTECT TREES
Protect from damage trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained.

3.5 SURFACE PREPARATION

Comply with NZS 3604, section 3.5, Site preparation. Remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area to be built on.

3.6 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove old foundations, slabs, drainage pipes, manholes, tanks, cables and redundant services. Report for instructions when any unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.

3.7 STOCKPILE TOPSOIL

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

3.9 GENERAL EXCAVATION

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

3.11 FOUNDATION EXCAVATION

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

3.12 INADEQUATE BEARING

If bearing is inadequate then excavate further and backfill with material as follows. Confirm any changes with the territorial authority.

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 material as listed.

3.13 GRANULAR BASE FOR SLABS

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

3.14 GENERAL BACKFILLING

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

3.15 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200 mm layers. Ensure any tanking membranes, drain coil and dampproofing are not punctured.

3.16 SURPLUS MATERIAL

Remove surplus and excavated material from the site

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

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.

2. PRODUCTS

2.1 NORMAL CONCRETE
Normal concrete 25 MPa grade (Exposure Zone D-Sea Spray), maximum aggregate size 19 mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

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

2.4 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.

2.5 TYING WIRE
Mild drawn steel wire not less than 1.2 mm diameter.

2.6 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.

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

2.8 CELLULAR POLYSTYRENE INSULATION
Proprietary expanded polystyrene (EPS) foam board to AS 1366 part 3.

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 INSTALL CELLULAR POLYSTYRENE INSULATION

Install EPS insulation system to manufacturer's requirements.

3.5 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.

3.6 ADJUSTMENTS

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

3.7 TOLERANCES, BENDING

To NZS 3109: clause 3.9, Tolerances for reinforcement.

3.8 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.

3.9 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.

3.10 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.

3.11 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.

3.12 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with NZS 3109: clause 5.6, 5.6.3 Type B.

3.13 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the territorial authority inspector.

3.14 SURFACE FINISHES

To NZS 3114: clause 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.15 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.

3.16 CONCRETE SURFACE TOLERANCES

To NZS 3114: clause 104, Surface tolerances and clause 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.17 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.

3.18 COMPACTION

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

3.19 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.

3.20 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: $^1/_3$ slab depth or 30 mm minimum.

3.21 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.

3.22 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.

3.23 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

3.24 CLEAN OUT

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

3.25 REMOVE

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

3801 CARPENTRY

1. GENERAL

This section deals with the supply and erection of light timber framing, floors, flooring underlays for ceramic tiling and insulation.

1.1 DOCUMENTS

Documents referred to in this section are:

AS/NZS 1748	Mechanically stress-graded timber
AS/NZS 1860.1	Particleboard flooring - Specifications
AS/NZS 2269	Plywood - Structural
AS/NZS 2904	Damp-proof courses and flashings
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
AS/NZS 4347	Damp-proof courses and flashings – Methods of test
BRANZ Bulletin 453	Fasteners selection
BRANZ Bulletin 368	Preventing moisture problems in timber framed skillion roofs

1.4 DIMENSIONS

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

2. PRODUCTS

2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to NZS 3602 and treatment to NZS 3640. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.

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

2.12 NAILS

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

2.13 BOLTS AND SCREWS

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

2.14 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.

2.15 CONNECTORS

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

2.16 POLYETHYLENE DPC
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.

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.

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

3.9 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.

3.10 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.

3.11 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.

3.20 DPC TO LOSP TREATED TIMBER
Lay polyethylene DPC under LOSP treated bottom plate of all external timber framed walls on concrete, in a single layer with 50 mm overlaps at joints to provide a waterproof barrier.

3.21 DPC TO TIMBER
Lay bituminous DPC under the bottom plate of all external timber framed walls on concrete, in a single layer with 50 mm overlaps at joints to provide a waterproof barrier.

3.22 INSTALL PROPRIETARY FIREPLACE

Prepare for the installation as detailed and as required by the manufacturer. Install strictly in accordance with AS/NZS 2918 and the manufacturer's stated and detailed requirements.

4102 WRAPS, UNDERLAYS AND DPC

1. GENERAL

This section deals with the application of DPC, underfloor foil insulation, wall wraps and roofing underlays.

Building code compliance

1.1 DURABILITY

The work covered by this part of the specification has been designed and manufactured to achieve the durability provisions of NZBC B2.3.1

Documents

1.2 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 4389	Safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
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.

1.4 ABBREVIATIONS

The following abbreviations are used in this specification.

NZMRM	New Zealand Metal Roofing Manufacturers Inc.

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 INSTALLATION SKILL LEVELS

Installers to be familiar with the manufacturer's technical literature and the NZMRM NZ metal roof and wall cladding – Code of practice.

2. PRODUCTS

Materials

DPC

2.1 POLYETHYLENE DPC

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.

Wall wraps

2.5 POLYETHYLENE BREATHER TYPE MEMBRANE
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.

2.6 POLYPROPYLENE BREATHER TYPE MEMBRANE
Absorbent breathable spun bonded non-woven polypropylene type building membrane.

2.7 BITUMINOUS STANDARD WEIGHT BUILDING PAPER
Bituminous standard weight building paper tested to NZS 4200.

Roofing underlay

2.11 BITUMINOUS HEAVY WEIGHT BUILDING PAPER
Bituminous heavy weight building paper tested to NZS 2295.

Accessories

2.16 WINDOW DOOR SEALING SYSTEM
Proprietary window and door flashing tape.

2.17 STUD STRAPS
19 mm wide polyethylene straps.

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

2.19 GUTTER AND UNDER FLASHINGS
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 bituminous breather type building paper**.**

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

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 manufacturers 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 polyethylene DPC under LOSP treated bottom plate of all external 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
Lay bituminous DPC under the bottom plate of all external timber framed walls on concrete, in a single layer with 50 mm overlaps at joints to provide a waterproof barrier.

Application – Wraps / wall underlay

3.8 WALL UNDERLAY
Fix horizontally to outside face of substrate in true alignment, with succeeding sheets overlapping 150 mm. Fix to manufacturers requirements. Scribe neatly around penetrations and openings to leave no gaps. Tape all penetrations. Keep clean, undamaged and without visible weather deterioration until closed in.

Application - Roofing underlay

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

3.10 BUILDING PAPER ROOF UNDERLAY
Lay vertically over purlins on wire netting with a 150 mm side lap. Fix securely to purlins with galvanized fixing clips. Lay underlay to avoid excessive dishing between purlins. When used vertically limit individual runs to 10 metres for bituminous based 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.

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

Completion

3.12 CLEAN UP
Clean up as the work proceeds.

3.13 LEAVE
Leave work to the standard required by following procedures.

3.14 REMOVE
Remove debris, unused materials and elements from the site.

4201 WALL CLADDING

1. GENERAL

This section deals with the supply and installation of exterior cladding, including any associated flashings and any timber fascias, barges, trims, beads and facings.

1.1 DOCUMENTS

Documents referred to in this section are:

NZBC E2/AS1	External moisture
	9.0 Wall claddings
	9.1 General
	9.3 Stucco
	9.4 Timber weatherboards
	9.5 Fibre cement weatherboards
	9.6 Profiled metal
	9.7 Fibre cement sheet
	9.8 Plywood sheet
AS/NZS 1491	Finger jointed structural timber
AS/NZS 2269	Plywood - Structural
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 3617	Profiles of weatherboards fascia boards and flooring
NZS 3631	New Zealand national timber grading rules
BRANZ Bulletin 441	Sealed joints in external claddings - 2. Sealants
BRANZ Bulletin 465	Domestic flashing installation
BRANZ Bulletin 467	Principles of flashing design

1.3 PERFORMANCE

Accept responsibility for the weathertight performance of the completed cladding system, including all penetrations.

2. PRODUCTS

2.1 BUILDING WRAPS AND UNDERLAYS

Breather type, waterproof, to NZBC E2/AS1, table 23: Properties of roof underlays and building wraps. Refer to SELECTIONS for type.

2.3 EXTERIOR CAVITY WALL BATTENS

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

2.4 EXTERIOR CAVITY VERMIN-PROOFING

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

2.6 STRUCTURAL PLYWOOD

Structural plywood to AS/NZS 2269.

2.8 TIMBER WEATHERBOARD

Dressing grade to NZS 3631, to NZS 3617 for profile and treated to NZS 3602, table 2, reference 2.A1, Requirements for wood-based building components to achieve a 15-year durability performance.

2.13 TIMBER FASCIAS AND BARGE BOARDS

Dressing grade to NZS 3631 and treated to NZS 3602, table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance. Finger jointed timber to AS/NZS 1491.

2.14 PVC JOINTERS
To suit sheet thickness.

2.15 NAILS, SCREWS AND FASTENINGS
Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability.

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

3. EXECUTION

3.1 MOISTURE CONTENT
Maximum allowable moisture content to NZS 3602 for:
Equilibrium moisture content (EMC)
- Framing: 20% at closing in
- Weatherboards: 14% at time of fixing
- Exterior joinery and trim: 14%

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

3.3 FIX WRAPS AND UNDERLAYS
Fix to framing, with laps and fixing to the cladding manufacturer's requirements.

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

3.6 INSTALL DRAINED CAVITY
20 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 over 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.

3.10 PRIME OR SEAL TIMBER WEATHERBOARDS AND TRIM
Prime or seal all front and back faces, edges and end grain before fixing weatherboards and exterior trim, to the finish and quality specified in PAINTING AND PAPERHANGING.

3.12 INSTALL TIMBER WEATHERBOARDS
Install level, true to line and face, to NZBC E2/AS1: 9.4 Timber weatherboards, and to NZS 3604, section 11.5.2, timber weatherboards. Refer to NZS 3604 for fixings durability requirements for specific provisions.

3.13 INSTALL FIBRE CEMENT WEATHERBOARDS
Install to the weatherboard manufacturer's requirements. Refer to the cladding manufacturer's literature for fixing details and NZS 3604 for fixings durability requirements for specific provisions.

3.14 INSTALL FIBRE CEMENT SHEET CLADDING
Install to detail and to the cladding manufacturer's requirements. Refer to the cladding manufacturer's literature for fixing

3.17 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.

3.18 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to BRANZ Bulletins 467 Principles of flashing design and 465 Domestic flashing installation.

3.19 USE OF SEALANTS

Selection and use of sealants to follow BRANZ Bulletin 441 Sealed joints in external claddings - 2. Sealants.

3.20 COMPLETE

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

3.21 REPLACE

Replace damaged or marked elements. Remove unused materials from the site.

4301D DIMOND PROFILED ROOFING

1. GENERAL

1.1 DOCUMENTS REFERRED TO
Documents referred to in this section are:

AS/NZS 2728	Prefinished/pre-painted sheet metal products for interior/exterior building applications - performance requirements
AS 3566	Self-drilling screws for the building and construction industries
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

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.

Dimond Roofing and Cladding Systems Manual, September 2001

Copies of the above literature are available on the **Dimond** website www.dimond.co.nz or by phoning **Dimond** on 0800 DIMOND (0800 346 663).

1.3 QUALIFICATIONS
Roofers to be Dimond Certified Installer, or experienced, competent roofers familiar with **Dimond** products.

1.4 WARRANTY
Warrant this work under normal environmental and use conditions against:

Coating:	15 year Failure of coating adhesion (manufacturer's standard warranty)
Penetration:	15 year weatherproofing by material penetration (manufacturer's standard warranty)
Execution:	5 year weatherproofing by substandard workmanship
From:	Date of completion of installation

Refer to the PRELIMINARIES AND GENERAL section for details of when completed warranty must be submitted.

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

1.6 CO-ORDINATE
Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof.

1.7 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 WIRE NETTING
Galvanized hexagonal 75 mm mesh from 1 mm steel wire to AS/NZS 4534.

2.2 UNDERLAY
Breather type kraft paper laminates.

2.3 DIMOND ROOFING
Refer to 4. SELECTIONS / drawings

2.4 FLASHINGS GENERALLY
Formable grade 0.55 mm BMT for galvanized, Zincalume® and pre-coated steel, and 0.90 mm BMT for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

2.5 FLASHINGS TO VERGE, RIDGE AND HIP
Supplied by **Dimond** to match or to suit the roofing.

2.6 FASTENERS GENERALLY
Durability of all fasteners not less than the roofing material being fixed.

2.7 FIXING CLIPS TO TROUGH SECTION ROOFING
Galvanized steel (powder coated for aluminium) to suit the material and profile of the rigid sheet and location as required by **Dimond** for **Dimondek 300** and **Dimondek 400**. Fix to steel with 16 mm x 10 gauge galvanized wafer head self-drilling screws and to timber with 50 mm long galvanized spiral rolled flat head nails or 10 gauge x 25 mm long wafer head timberlite screws – Class 4.

Fix **Dimondek 630** clips to steel with 20 mm x 12 gauge hex screws and to timber with 10 gauge x 25 mm long wafer head timberlite screws – Class 4.

2.8 FIXING SCREWS
To AS 3566. Screws appropriate to the roofing material and the supporting structure, and wind load as required by **Dimond,** and with a durability not less than the material fixed.

2.9 RIVETS
Sealed aluminium, minimum diameter 4.8 mm.

2.10 SEALANT
Neutral curing silicone or polymer sealant as required by **Dimond** and used as directed.

2.11 CLOSURE STRIPS
Non-bituminous compressible, profiled closed cell foam strips to fit the sheet profile.
Brand: Ecofoam
Profile: To suit selected cladding profile

3. EXECUTION

Conditions

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

3.2 STORAGE
Take delivery of and accept packs of roofing dry and undamaged on delivery. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets.

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

3.4 SEPARATION
Isolate dissimilar materials in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and

treated timber and cement based materials. Do not use unpainted lead sheet in contact with or allow water run-off onto galvanized steel or Zincalume®.

3.5 SET-OUT & LAYING
Carefully set out to allow cover flashings of equal width at the ends of the building. Lay sheets with side laps away from the line of sight ensuring ends of sheets are true to line. Check during fixing to eliminate creep or spread and use string lines along purlin centres to keep fastenings in line.

3.6 FORMING
Form stop-ends and downturns to **Dimond** recommendations.

3.7 SEAL CUT EDGES
Seal cut edges of pre-coated steel sheet with edge protection lacquer before fixing to **Dimond** requirements.

3.8 END LAPS
End laps are not permitted, except where specifically detailed to **Dimond** requirements.

3.9 THERMAL MOVEMENT
Roof fixing and jointing to conform with **Dimond** requirements for thermal movement.

3.10 FIXING GENERALLY
Install and fix in accordance with the Dimond Roofing and Cladding Systems Manual and the NZ Metal Roofing Manufacturers Inc: NZ metal roofing & wall cladding code of practice and to **Dimond** required fixing patterns and details for each area of the building roofing. Use only screws as required by **Dimond**. Paint colour matched fixings and accessories before installation.

3.11 FIX UNDERLAY
Fix wire netting where specified, drawn tight and nailed or screwed to purlins with edges butted and wired together to form a complete net. Fit and lap roofing underlay over the netting to suit roofing sheets, with 40 mm oversail into gutter, to the underlay manufacturer's requirements.

3.12 MARKING AND CUTTING
Cut only by shearing tools. Do not use black lead pencils for marking Zincalume®, Colorsteel® or ColorCote® products.

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

3.14 FLASH
Flash roof to parapets, walls and penetrations to detail in the Dimond Roofing and Cladding Systems Manual and to the New Zealand Metal Roofing Manufacturer's Association Inc: NZ metal roofing & wall cladding code of practice. Cut accurately and fix using sealant and rivets to detail and to **Dimond** requirements to form a weatherproof cover. Ensure flashings are designed and installed to avoid water ponding.

3.15 FIX RIDGES AND HIPS
Cut accurately and fix using primary fasteners to the purlins. Join using sealant and rivets to detail and to the New Zealand Metal Roofing Manufacturers Inc: NZ metal roofing & wall cladding code of practice. Ensure flashings are designed and installed to avoid water ponding.

3.16 FIX VERGE AND CAP FLASHINGS
Cut accurately and fix using primary fasteners to the purlins. Join using sealant and rivets to detail and to the New Zealand Metal Roofing Manufacturers Inc: NZ metal roofing & wall cladding code of practice. Ensure flashings are designed and installed to avoid water ponding.

3.17 PENETRATIONS

Flash and overflash all penetrations through the roof.

3.18 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).

3.19 REPLACE

Replace damaged or marked elements.

3.20 LEAVE

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

3.21 REMOVE

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

3.22 PROTECTION

Protect the completed work from damage for the remainder of the construction period. If access is given to the roof for later work, provide properly constructed walkways or platforms to eliminate damage

4502 ALUMINIUM WINDOWS AND DOORS

1. GENERAL

1.1 RELATED SECTIONS
Refer to 4601 GLAZING for glazing.

1.2 DOCUMENTS
Documents referred to in this section are:

NZS 3604	Timber framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
WANZ	Aluminium Window Handbook
WANZ	Specification for powder coatings on architectural aluminium products
WANZ	Installation code for aluminium joinery products
WANZ	Window installation system: An Alternative Solution for the installation of Windows and doors

BRANZ Bulletin 349: Finishes for aluminium

1.4 SUBMIT SAMPLE SECTIONS
Submit full size section samples, with the selected finish of all profiles offered.

1.5 SHOP DRAWINGS
Shop drawings to show, but not be limited to:
- Fully dimensioned elevations of all elements (minimum scale 1:20)
- Dimensions of all typical elements and of any special sizes and shapes
- Glazing specification and details

Provide a copy of shop drawings revised to include required modifications, before proceeding with any fabrication or erection.

1.6 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.

1.7 QUALIFICATIONS
Fabrication by a member of WANZ.

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

2. PRODUCTS

2.1 WINDOW AND DOOR SECTIONS
Form all aluminium members from extruded sections. Folded sections are restricted to flashings and concealed members only.

2.2 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.

Components – for cavity systems

2.4 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.

2.5 WANZ SUPPORT BAR
Extruded aluminium support bar with built in drainage and ventilation to NZBC E2, to provide continuous support to the window unit.

2.6 WANZ SUPPORT ANGLE
Support angle for use with the sill pan for deeper claddings to transfer the weight of the window back to the frame.

Components

2.7 WINDOW HARDWARE
Fasteners, stays, locks, vents and other hardware as scheduled. Refer to 4. SELECTIONS. Where hardware is not scheduled, use hardware from window manufacturer's standard range. Key alike all lockable window hardware able to be keyed alike.

2.8 DOOR HARDWARE
Locks, bolts, door rollers, door restrictors, hinges and other hardware as scheduled. Refer to 4. SELECTIONS. Where hardware is not scheduled, use hardware from door manufacturer's standard range. Key alike all door locks 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.

2.10 FABRICATION SEALANT
To the window manufacturer's requirements.

2.11 GLAZING TAPE AND GASKETS
To the window manufacturer's requirements.

2.12 FIXINGS
Ensure all fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.

Finishes

2.13 ORGANIC POWDER COATING FINISH
To AS 3715 and WANZ Specification for powder coatings on architectural aluminium products. All finished surfaces to show uniformity of gloss and colour (to match approved sample) free of all coating defects.

2.14 ANODISING
To BRANZ Bulletin 349 "Finishes for aluminium".

3. EXECUTION

3.1 CONFIRM
Confirm all framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of aluminium joinery.

3.2 EXECUTION GENERALLY
Execute all fabrication and installation work in accordance with the requirements of NZS 4211, WANZ Aluminium window handbook and WANZ Installation code for aluminium joinery products.

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

3.4 SAFETY STAYS

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

3.5 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.

3.6 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.

3.7 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 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).

3.8 FIX FRAMES

Fix frames rigidly in place without distortion, to the window manufacturer's and WANZ Aluminium window handbook requirements, plumb, true to line and face, weathertight and with all openings operating freely.

3.9 DRAINAGE

Provide anti-condensation channels to all sills. Sills to sashes and fixed lights to incorporate positive drainage to the exterior.

3.10 INSTALLATION GENERALLY

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

3.12 INSTALLATION CAVITY CONSTRUCTION

Install to WANZ Installation System details and drawings including WANZ cavity closers, support bars and support angles

Flashings and air seals

3.13 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.

3.14 COMPLETE AIR SEAL

Form an air-tight seal by means of proprietary expanding foam, compressible foam strips, or sealants used with backing rods, applied deep within the reveal to completely fill the

gap between joinery and structural framing. Ensure that in combination with the internal linings a complete air seal is created.

Completion items

3.15 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.

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

3.17 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.

3.18 MANIFESTATIONS
To NZS 4223, part 3, 303.1.

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

3.20 CLEAN FRAMES
On completion clean down both sides of window and door frames using the methods required by the window and door manufacturer.

3.21 CONFIRM
Confirm the proper operation of hardware and operating systems on completion of the installation and again at completion of the contract works.

4601 GLAZING

1. GENERAL

1.1 DOCUMENTS
Documents referred to in this section are:

NZBC B1/AS1	Structure, 7.0 Glazing
NZBC F2/AS1	Hazardous building materials, 1.0 Glazing
NZBC F4/AS1	Safety from falling, 1.0 Barriers in buildings
NZS 3604	Timber framed buildings
NZS 4223	Glazing in buildings Part 1: The selection and installation of glass in buildings Part 3: Human impact safety requirements Part 4: Dead, wind and snow loading
AS/NZS 2208	Safety glazing materials in building
AS/NZS 4666	Insulating glass units
AS/NZS 4667	Quality requirements for cut-to-size and processed glass

2. PRODUCTS

2.1 GLASS
Processed glass to AS/NZS 4667, thickness to NZS 4223 parts 1, 3 and 4 unless otherwise specified:

Clear float glass:	Clear annealed transparent float glass
Patterned glass:	Translucent, annealed, rolled glass with a decorative pattern on one surface.
Wired glass:	With 13 mm square welded, treated steel wire mesh in the centre.
Laminated glass:	Grade A safety glazing material to AS/NZS 2208 with PVB or CIP resin interlayer.
Toughened glass:	Grade A safety glazing material to AS/NZS 2208.
Tinted float glass:	Body tinted float glass

Special glass, thickness to NZS 4223 parts 1, 3 and 4 unless otherwise specified:

Solar float glass:	Coated glass and low-E glass made from float glass
Insulating glass units (IGU's):	To AS/NZS 4666 and IGU Manufacturer's Association (IGUMA) requirements.

2.2 TEMPORARY PROTECTION FILM
Factory applied UV resistant film to protect the glass from construction damage.

2.3 MIRROR GLASS
Float mirror glass to NZS 4223, part 1, clause 101.2.2.2: (b) Silvering quality (selection S), with silver and copper plating and 2 coats of protective paint.

2.4 SAFETY MIRROR GLASS
Float mirror glass with silver plating and vinyl backing, safety glazing material to AS/NZS 2208.

2.5 GLASS SCREENS
Proprietary shower/bath screens, formed to shape before toughening, complete with matching hardware.

Components, aluminium glazing

2.11 GLAZING TAPE AND GASKETS
Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

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

Components, mirrors

2.13 MIRROR ADHESIVE
Adhesive mirror-mastic and double-sided adhesive tape.

3. EXECUTION

3.1 GLAZING GENERALLY
To NZS 4223, part 1, and for human impact safety glazing to NZS 4223, part 3.
To AS/NZS 4666 for IGU's.

Application mirrors

3.8 MIRRORS, SCREW FIXED
Fix with proprietary countersunk-head screws, fitted with black neoprene washers with fine-threaded upstands to receive chrome plated dome screw covers.

3.9 MIRRORS, CHANNEL MOUNTED
Fix with proprietary mounting channels, to the channel manufacturer's requirements.

3.10 MIRRORS, ADHESIVE FIXED
Fix with adhesive mirror-mastic and double-sided adhesive tape.

Application miscellaneous

3.11 INSTALL GLASS BALUSTRADES
Confirm/design and carry out installation to requirements of NZBC B1/AS1: 7.0 Glazing, NZBC F2/AS1: Glazing and NZBC F4/AS1: Safety from falling: 1.0 Barriers in buildings.

3.12 INSTALL GLASS SCREENS
Install shower and bath screens and doors to manufacturer's requirements. Fix wall channel with silicone sealant.

Finishing

3.13 SAFETY
After glazing indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type.

3.14 MANIFESTATIONS
To comply with NZS 4223, part 3, 303.1.Manifestations (making glass visible)

3.15 TRADE CLEAN
Clean off or remove safety indicators and any temporary protection film at completion of the building.

5101 PLASTERBOARD LININGS

1. GENERAL

This section deals with the supply, fixing and jointing of gypsum plasterboard sheets and accessories to timber and steel framed walls and ceilings to form standard, bracing, fire-rated, wet area and sound rated systems.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS 1397	Steel sheet and strip - hot-dipped, zinc-coated, or aluminium/zinc-coated
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber framed buildings
ASTM C630/C630M-96a	Water-resistant gypsum backing board
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 QUALIFICATIONS

Plasterboard fixers and stoppers to be experienced competent workers, familiar with materials and techniques specified. Submit evidence of experience on request.

Performance

1.4 INSPECTIONS AND ACCEPTANCE

Inspect the finished surface of the installed plasterboard:
- 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.

1.7 BRACING REQUIREMENTS

Provide braced wall systems using bracing rated plasterboard sheet to meet the requirements of NZS 3604 when tested in accordance with BRANZ technical Paper P21: “A wall bracing test and evaluation procedure.”

2. PRODUCTS

Materials

2.1 GYPSUM PLASTERBOARD

Gypsum plaster core encased in a durable face and backing paper formed for standard use to AS/NZS 2588.

2.2 GYPSUM PLASTERBOARD, WALL BRACING SYSTEMS

Gypsum plaster core encased in a durable face and backing paper bracing rated sheet to AS/NZS 2588.

2.3 GYPSUM PLASTERBOARD, WATER RESISTANT SYSTEMS

Gypsum plaster core containing a wax emulsion encased in a durable face and backing paper formed for standard and fire rated use to AS/NZS 2588 and for water resistance use to ASTM C630/C630M-96a.

2.8 CORNICE

Plasterboard, scotia pattern.

Components

2.9 CEILING BATTENS, METAL
0.55 mm galvanized steel (275 g/m^2 zinc coating) battens and matching perimeter channels.

2.10 CEILING BATTENS, TIMBER
Species, in service moisture content and treatment as set out in NZS 3602 and grading to NZS 3631.

2.11 NAILS, TIMBER FRAME

10 mm plasterboard:	30 mm x 2.5 mm galvanized drywall clouts
13 mm plasterboard:	40 mm x 2.5 mm galvanized drywall clouts
2 x 10 mm plasterboard:	30 mm x 2.5 mm galvanized drywall clouts (inner layer) 40 mm x 2.5 mm galvanized drywall clouts (outer layer)
10 mm + 13 mm plasterboard:	40 mm x 2.5 mm galvanized drywall clouts (inner layer) 50 mm x 2.5 mm galvanized drywall clouts (outer layer)
2 x 13 mm plasterboard:	50 mm x 2.5 mm galvanized drywall clouts (inner layer) 60 mm x 2.5 mm galvanized drywall clouts (outer layer)

Nails for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

Nails for perimeter nailing for bracing systems complete with 15 mm galvanized steel washers as required by the sheet manufacturer's approved specification.

2.12 SCREWS, TIMBER FRAME

10 mm plasterboard:	Type S gypsum screws 25 mm x 6 gauge
13 mm plasterboard:	Type S gypsum screws 32 mm x 6 gauge
2 x 10 mm plasterboard:	Type S gypsum screws 41 mm x 6 gauge (inner layer) Type S gypsum screws 51 mm x 7 gauge (outer layer)
2 x 13 mm plasterboard:	Type S gypsum screws 51 mm x 7 gauge (inner layer) Type S gypsum screws 63 mm x 8 gauge (outer layer)

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.13 SCREWS, STEEL FRAME / BATTENS

10 mm plasterboard:	Type S gypsum screws 25 mm x 6 gauge
13 mm plasterboard:	Type S gypsum screws 32 mm x 6 gauge

Screws for fire rated and sound rated systems as required by the sheet manufacturer's approved specification.

2.14 SECTIONS AND TRIM MATERIAL
Form from galvanized steel of a coating class not less than ZM275 to AS 1397 and fix with 30 mm x 2.5 mm galvanized clouts.

2.15 EXTERNAL ANGLE
Perforated.

2.16 INTERNAL REINFORCING ANGLE
Perforated.

2.17 CONTROL JOINT
With plastic protective tape.

2.18 CASING BEAD
To suit sheet thickness.

2.19 RESILIENT RAIL
To Z profile for sound rated systems. Fix with 25 mm x 6 gauge countersunk screws.

2.20 J MOULD
Extruded uPVC dimensioned to suit the sheet thickness and fixed with 25 mm x 1.6 mm nickel panel pins.

2.21 TAPE ON EDGE TRIMS
Tape-on paper tape and galvanized steel trims and edges.

2.22 EDGE PROFILES
Pre-formed aluminium profiles, with perforated edge trims.

Accessories

2.23 ADHESIVE
Multi-purpose water based wallboard adhesive.

2.24 JOINTING COMPOUNDS
System match bedding compound and finishing compound. Refer to the sheet manufacturer's literature and follow their requirements on which compounds to use with which accessory and in which location, to achieve the required level of finish.

2.25 TAPE
System match reinforcing tape.

2.26 SOUND RATED SEALANT
To be part of the sound rated wall system offered.

Finishes

2.27 SKIMCOAT PLASTER
Proprietary spray-on surface finish.

3. EXECUTION

Conditions

3.1 HANDLE AND STORE
Handle and store sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material.

3.2 SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements.

3.3 MOISTURE CONTENT
Maximum allowable moisture content in accordance with NZS 3602 for:
Framing at lining: 16% for plasterboard linings

3.4 PROTECT
Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.5 LEVELS OF FINISH
Provide the scheduled plasterboard surfaces to the levels of finish specified in AS/NZS 2589.

3.6 LEVELS OF 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.

3.7 GENERAL REQUIREMENTS
Leave a 10 mm gap at floor level. Do not break the face paper. Position sheets to a “touch fit” with no forcing or springing into place. Run sheets over doors and under and over window openings. Apply adhesive in daubs 25 mm diameter and 10 mm thick. Do not place daubs at sheet perimeters or under nail and screw fixings.

Application - fixing

3.8 INSTALL CEILING BATTENS
Install in accordance with the batten manufacturer’s requirements.

3.9 LINE CEILINGS AND WALLS
Line ceilings and walls with the various sheets and fix to the sheet manufacturer's details and requirements, using tapered edge joints as far as possible.

3.10 LINE WALLS
Line walls up to 2700 mm high by the horizontal method and walls above 2700 mm high by the vertical method.

3.11 END BUTT JOINTS
When end butt joints are unavoidable, locate staggered off the framing, back block, fix and stop to the sheet manufacturer's details and requirements.

Application - bracing systems

3.18 LINE BRACING WALLS
Line walls with high density plasterboard sheet to form panels or systems, clout-washer and clout fixed to the sheet manufacturer's details. Do not fix bracing sheets until steel bracing and/or straps are in place.

Application - wet area systems

3.19 LINE WET AREA WALLS
Line walls strictly in accordance with the sheet manufacturer’s requirements.

Application - finishing sections and trim

3.20 FIX EXTERNAL ANGLE
Fix full length to external corners with clouts at 100 mm centres each side staggered to the sheet manufacturer's details and requirements.

3.21 FIX INTERNAL REINFORCING ANGLE
Fix full length to internal corners with clouts at 100 mm centres each side staggered to the sheet manufacturer's details and requirements.

3.22 FIX CASING BEAD
Fix between dissimilar materials and caulk with sound rated sealant to the sheet manufacturer's details and requirements.

3.23 FIX J MOULD
Fix between dissimilar materials and caulk with sound rated sealant to the drawings supplied.

3.24 FORM CONTROL JOINTS
Provide at maximum 9 metre centres in long unbroken walls and 12 metre centres to ceilings to the sheet manufacturer's details and requirements. Fix control joint section into joint by staples at 150 mm both sides. Fill gap in voids with sound rated sealant. Remove plastic tape after stopping.

3.25 FIX COVER MOULDS
Fix to the sheet manufacturer's details and requirements and to the drawings supplied.

3.26 FIX CORNICE
Fix with adhesive required by the sheet manufacturer and joints mitred to the sheet manufacturer's details and requirements

3.27 FORM SQUARE STOPPED CORNERS
Form taped reinforced square stopped ceiling-to-wall angles to the sheet manufacturer's requirements.

3.28 INSTALL TAPE-ON TRIMS
Install in accordance with the trim manufacturer’s requirements.

3.29 INSTALL SPECIAL EDGES AND BANDS
Install in accordance with the edging manufacturer’s requirements.

Finishing - stopping

3.30 FORM JOINTS
Fill recess with bedding compound, centre the reinforcing tape, apply a second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off, to the sheet manufacturer's details and requirements.

3.31 STOPPING NAILS AND SCREWS
Apply two successive coats of bedding compound and a coat of finishing compound to the sheet manufacturer's requirements.

3.32 SQUARE STOPPED CORNERS
Fill with bedding compound, centre reinforcing tape into internal angle and apply a coat of finishing compound and complete to the sheet manufacturer's details and requirements.

3.33 EXTERNAL ANGLES
Apply two coats of bedding compound followed by a coat of finishing compound to the sheet manufacturer's requirements.

3.34 END BUTT JOINTS
Fill, tape and coat as for tapered edge joints except that each stage is doubled in width.

3.35 APPLYING SKIMCOAT PLASTER
Apply spray-on surface finish in accordance with the sheet manufacturer’s requirements.

Completion

3.36 REPLACE
Replace damaged sheets or elements.

3.37 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 to the standard required for following trades.

3.38 REMOVE
Remove debris, unused materials and elements 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.

1.3 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

uPVC

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

2.2 uPVC DOWNPIPES
Tubes, stand-off brackets and fittings brand matched and complete to the manufacturers specifications.

Galvanized steel

2.3 GALVANIZED SHEET STEEL
0.55 mm sheet steel galvanized to AS 1397.

2.4 GALVANIZED STEEL SPOUTING
Profile, jointing, brackets and fittings brand-matched and complete to the spouting manufacturer's specifications.

2.5 GALVANIZED STEEL DOWNPIPES
Seam jointed and complete with stand-off brackets galvanized screws.

Aluminium/zinc alloy coated pre-painted steel

2.9 ALUMINIUM/ZINC ALLOY PRE-PAINTED SHEET STEEL
0.55 mm sheet steel coated to AS 1397, pre-painted.

2.10 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING
Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

2.11 ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES
Seam jointed and complete with stand-off brackets and galvanized screws.

Materials - fascia/barge system

2.16 EXTERNAL FASCIA/BARGE SPOUTING SYSTEM
Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to the manufacturer’s requirements.

2.17 METAL FASCIA AND BARGE CONCEALED SPOUTING
Rainwater system of brackets, clip on pre-finished steel fascia and concealed spouting system.

General

2.18 RAINWATER HEADS, DROPPERS, OVERFLOWS
Fabricate and install as detailed.

2.19 FLASHINGS GENERALLY
0.55 mm sheet steel galvanized to AS 1397, aluminium/zinc coated to AS 1397, 1.8 mm (20 kg/m^2) copperised pure lead, 0.5 mm half hard copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 304 Flashing design.

2.20 DOMES
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.

uPVC

3.4 FIT uPVC SPOUTING
Fit brackets at maximum 500 mm centres and fix with galvanized screw. Set to fall to outlets. Ensure solvent welded or rubber ring jointed spouting sections are complete with all fittings to the spouting manufacturer's requirements. Allow for expansion.

3.5 FIT uPVC DOWNPIPES
Fit stand-off brackets or clips at maximum 1 metre centres and fix with round head galvanized screws. Set pipes plumb and clear of the wall. Solvent weld joints. Discharge into stormwater drain.

Galvanized steel

3.6 FIT GALVANIZED STEEL 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.

3.7 FIT GALVANIZED STEEL 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.

Aluminium/zinc alloy coated steel pre-painted

3.10 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.

3.11 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.

Application - fascia and barge concealed spouting system

3.14 INSTALL FASCIA AND BARGE CONCEALED SPOUTING SYSTEM
Ensure rafters/outriggers are true-to-line and face and fix stand-off brackets before roofing is in place. Cut fascia/barge to required length, seal edges and clip fit rigidly to brackets with cover moulds at corner and running joints. Cut spouting to length to form folded lap joints elsewhere complete with downpipe droppers and expansion joints for thermal movement, all silicone sealed and riveted. Install overflows at all rainwater heads and downpipe locations as required by the spouting manufacturer. All completed to the spouting manufacturer's required practice and fixed by the spouting manufacturer's approved installers.

General

3.17 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.

3.18 INSTALL DOMES
Install wire mesh domes at the top of downpipes.

3.19 INSTALL SPOUTING MESH
Install mesh into spoutings, strictly in accordance with the mesh manufacturer's requirements.

3.20 FLASH ROOF LIGHTS
Flash to roofing to the manufacturer's specifications.

3.21 LEAVE
Leave rainwater services in proper working order and all flashing work completed to keep the building weathertight.

3.22 CLEAN UP
Wash out gutter daily and on completion to remove swarf. Take away from the site unused materials and elements

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	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 3500	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

1.3 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 INSTALL ELECTRIC PAN VENTS

Install electric pan vents to manufacturers' requirements. Leave ready for electrical connection by electrician.

3.6 PENETRATIONS

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

3.7 INSTALL SANITARY ACCESSORIES

Install sanitary accessories as selected.

3.8 TEST

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

3.9 CLEAN UP

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

7701 ELECTRICAL

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)

1.3 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.

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

1.5 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 livening of supply.

2. PRODUCTS

2.1 MAINS SUPPLY, SINGLE PHASE
Tough plastic sheathed neutral screened cable to NZS 6401 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES
Tough plastic sheathed copper conductors to NZS 6401, stranded above 1.0 mm^2, and to AS/NZS 3008.1.2. Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the connected load, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.0 mm^2 on 10 amp MCBs
Lighting circuits:	Commercial: 1.5 mm^2 on 16 amp MCBs
Power circuits:	1.5 mm^2 on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5 mm^2 on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5 mm^2 on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5 mm^2 on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres

Range circuits: Single phase: 6 mm^2 on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions may be above 35°C.

2.3 DATA WIRING
To AS/NZS 3086.

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

2.5 DISTRIBUTION BOARD
Proprietary manufactured, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCBs, 30 mA RCDs and 60 amp main switch, complete with 20% spare capacity to AS/NZS 3000. Include 2 spare MCBs labelled as “spare”. All protective devices: 6kA MCBs of the appropriate rating.

2.6 MINIATURE CIRCUIT BREAKERS
Miniature moulded case circuit breakers

2.7 WALL BOXES
Standard size in plastic, with 2 or more gang size in metal, all screw fixed.

2.8 SWITCH UNITS
Sixteen amp minimum rated, 230 volt polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2 way units

2.9 HOT WATER SYSTEM SWITCH
One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

2.10 SWITCHED SOCKET UNITS
Ten amp, 230 volt polycarbonate flushplate 3 pin flat NZS combination switch units, single or multi gang as detailed.

2.11 SMOKE ALARMS
To AS 3786. A wired 230 volt ionised smoke detector type.

2.12 CEILING ROSES
White plastic mounting base with screwed cover. Terminal type. Cylindrical section TPS for suspended fittings.

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

2.14 DOOR BELL SYSTEM
Complete with transformer for mounting on distribution board.

2.15 TV AERIAL
Antenna, co-axial cable and outlets, suitable for both VHF and UHF reception of all local free-to-air broadcast channels.

2.16 GARAGE DOOR CONTROLLERS
Refer to 4503 COMPOSITE WINDOWS, DOORS AND SKYLIGHTS. Provide single switched socket outlet for the door controller to plug into.

2.17 LIGHT FITTINGS
Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.90 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 240v rated,

bayonet cap; Fluorescent triphosphor 2700K; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise.

3. EXECUTION

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

3.2 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.

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

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

3.5 EARTH LEAKAGE PROTECTION
RCD protection to AS/NZS 3000

Residential (other than single and multiple domestic)
Install RCD protection at the switchboard of final sub circuits controlling socket outlets except for:
- Fixed cooking equipment
- Lighting

Do not install RCDs for:
- Socket outlets positioned over 2300 mm above floor level
- Appliances rated at less than 150 watts

3.6 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.

3.7 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.

3.8 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 nogs. Fix switch panel wall boxes to solid blocking.

3.9 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.

3.10 ISOLATING SWITCHES

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

3.11 LIGHT FITTINGS

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

3.12 EXTRA LOW VOLTAGE LIGHTING

Where remote transformers are used for ELV lamps, connect from transformer to lamp with minimum 2.5 mm^2 conductor, to ensure voltage drop in transformer and conductor 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 rear of light fittings are adequately ventilated and clear of any thermal insulation.

3.14 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.

3.15 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.

3.16 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.

3.17 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.

3.18 DATA WIRING

Install data wiring to outlet positions shown on the drawings. Install in conduit for outlets on masonry surface.

3.19 TV AERIAL

Fit antenna, run cabling concealed below the roof and fit outlets where shown on the electrical drawings. Ensure the system is suitable for high quality reception of all VHF and UHF channels - Sky TV installation practices minimum.

3.20 SPACE HEATERS

Install to the heater manufacturer’s requirements, fitted neatly and without damage to surrounding finishes. Ensure control thermostats are fitted to appliance or otherwise connect to a remote thermostat.

3.21 CONNECT UNDERTILE HEATING

Run cabling to connect to under tile heating system to the manufacturer’s requirements in positions shown on the drawings. Install with control panel and associated equipment fitted neatly and without damage to surrounding finishes.

3.22 CENTRAL VACUUM SYSTEM

Install central system, ducting and outlets to the system manufacturer's requirements, with room outlets fitted neatly and without damaging surrounding finishes. Connect and terminate controls to mains wiring standards.

3.23 SECURITY SYSTEM

Install to the system manufacturer's requirements, with control panel, detectors and associated equipment fitted neatly and without damage to surrounding finishes.

3.24 MANUAL FIRE ALARM SYSTEM

Install to the system manufacturer's requirements, with outlets fitted neatly and without damage to surrounding finishes.

3.25 SMOKE ALARMS

Install smoke alarms to NZBC F7/AS1 and to the alarm manufacturer's requirements, fitted neatly and without damage to the surrounding finish.

3.26 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.

3.27 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.

3.28 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 mm^2 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.

3.29 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.

3.30 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.

3.31 COMPLETION

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