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Consent Issue 22.12.05

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INDEX

SECTION 1 - PRELIMINARIES

SECTION 2 - EXCAVATION

SECTION 3 - CONCRETE WORK

SECTION 4 – INSULATED BLOCKWORK & PLASTER SYSTEM

SECTION 5 - CARPENTRY

SECTION 6 - WOOD JOINERY

SECTION 7 - ALUMINIUM JOINERY

SECTION 8 – ROOFING

SECTION 9 – PLUMBING, GAS AND DRAINAGE

SECTION 10 - ELECTRICAL

SECTION 11 - PAINTING

SECTION 12 - GLASS AND GLAZING

SECTION 13 - FLOOR COVERINGS

SECTION 14 - SITE WORKS AND DRAINAGE

SECTION 15 - STRUCTURAL STEELWORK

SECTION 16 – HARDWARE

H1 CALCULATIONS

WEATHERTIGHT MATRIX

TRADE LITERATURE

SECTION 1 - PRELIMINARY AND GENERAL (ALL TRADES)

1.1 CONTRACT

This Specification shall be taken as forming part of the contract.

The owner shall provide a form of Contract which is to be completed by all parties before the commencement of any work on site.

The requirements of the Building Act and Building Code of New Zealand, together with Local Authority By Laws shall also be taken as part of this Specification.

1.2 DRAWINGS AND SETTING OUT

Tender's shall acknowledge in their tenders the drawing numbers on which their tenders are based.

The contractor shall be responsible for the verification of all dimensions and levels and for accurately setting out the building. Any discrepancies between drawings, specification and actual conditions met on site shall be reported to the Employer for instructions before proceeding.

1.3 OBVIOUS WORK

Allow for and carry out all work shown on the drawings but not specified and vice versa which is obviously necessary for the completion of the work and compliance with the Building Code and related codes. This will include for leaving the works completely water tight, vermin and bird proof.

1.4 SITE DOCUMENTS

A complete set of drawings and specification adequately protected is to be kept on site at all times. No details may be altered without the written approval of the designer or engineer. Check all dimensions prior to commencing any work and mark all changes to the building on the site drawings.

1.5 PROTECTION AND SAFETY

The contractor shall do everything prudent or necessary to ensure the safety and freedom from injury or interference of all the adjacent real or personal property whatsoever and of any persons on or in the vicinity of the site.

Take reasonable steps to minimise nuisance to adjoining owners, their tenants and others, including nuisance from noise, dust, debris, and obstructions arising from the works.

Provide tarpaulins and other coverings sufficient to protect all construction, fittings and furnishings. Make good or re execute any damage or loss due to inclement weather, theft, breakage or settlement. Keep all building materials subject to damage by moisture or exposure in a dry place.

Ensure that all tools, tackle, gear, stagings, scaffolding, ladders, machines and all other equipment used on the works are of adequate strength and safe for use.

The contractor is to take care of roadways, footpaths, drainage pattern, waterways and any existing vegetation and to make good any damage incurred during the course of the contract. Provide suitable plank or steel plate crossovers where required.

1.6 NOTICES AND FEES

The contractor shall give all notices required under the Contract and pay all fees as required by local and supply authorities. Arrange to obtain all supply services.

The contractor will not be required to pay Local Council Building Consent fees. Owners will attain Building Consent prior to commencement on site.

1.7 INSURANCES

The contractor shall cover the works against Public Risk for the period of his site tenure. In addition, all new works shall be covered by a comprehensive policy against fire, earthquake, storm, and tempest for the full amount of the Contract. Any excesses to be paid on claims as a result of the works shall be paid by the contractor. Amendments to these insurance's shall be as noted in the attached schedule.

Proof of the existence of policies shall be required by the employer prior to commencement on site.

1.8 TENDER

Neither the lowest nor necessarily any tender will be accepted. The contractor shall submit a Lump Sum Tender for the execution and completion of the work shown on the drawings and also for all work described in this specification.

1.9 GUARANTEES

As soon as possible after Practical Completion procure relevant guarantees, to be effectively transferred to or issued directly in favour of the owner so that the guarantor is directly responsible to the owner.

1.10 STANDARDS

All materials, items and workmanship shall comply with the minimum requirements of the appropriate New Zealand standards. In the event of there being no NZ standard the material, items or workmanship shall be of the best quality and standard to the approval of the employer.

1.11 PROPRIETARY BRANDS

When proprietary brands, materials or equipment are used they shall be installed as per the manufacturer's instructions, and where required to be new shall arrive on site in the manufacturer's packaging.

1.12 CONTINGENCY

Allow the sum of 5% of works value Contingencies which may arise and be authorised by the employer during construction. This is to be deducted wholly or in part if not so used.

1.13 PROVISIONAL SUMS & PRIME COST SUMS

Provisional Sums (supply and install) and Prime Cost Sums (supply only) as set out in the attached Schedule are to be included in the contractor's tender. All sums are subject to actual adjustment in the final contract sum.

1.14 NOMINATED SUPPLIERS, SUPPLIES AND SUB CONTRACTORS

Will be chosen and the articles listed in the attached schedule, they will be selected by the employer in accordance with the Conditions of Contract.

Nominated Sub-Contractors are to come within the terms and conditions of this contract.

1.15 SITE INSPECTIONS

Before tendering the contractor is advised to visit the site, inspect same, and acquaint himself with the nature of the work and difficulties to be overcome. No extra will be allowed for failure to observe this direction.

1.16 PLANT, EQUIPMENT AND TEMPORARY SERVICES

The contractor is to provide all tools, plant, lifting gear scaffolding, etc. as required for carrying out the work, together with power and temporary services required for working same. Pay all fees and charges for connection and remove from site on completion of the contract.

1.17 DEFECTS AND MAINTENANCE

Any defects, shrinkage or other faults which may appear and be notified in writing to the contractor within the Defects Liability Period after Practical Completion, and due to materials or workmanship not in accordance with this Contract shall, and within such reasonable time, be amended and made good by the Contractor at his own cost.

1.18 COMPLETION

The contractor shall make all trades responsible for periodically cleaning away their rubbish and surplus material from site.

Clean the whole of the works frequently.

At Practical Completion, ease doors, windows, and all movable fittings, properly tabulate keys, and hand over. Clean glass both sides, clean and polish all floors, vacuum carpets, remove paint splashes etc. and leave the whole area fit for immediate occupation. Clean the surrounding areas to the building and remove all rubbish from site.

SECTION 2 - EXCAVATION

2.1 SCOPE

Remove any topsoil and other vegetable matter from under the new building works including shrubs, grass and other plant growth, organic debris and roots.

Excavate for pile foundations, footings, drains, services etc. to the level, extent and depth required.

2.2 EXCAVATIONS FOR FOUNDATIONS

Footing excavations are to be taken down to solid bearing, not less than 300 mm deep or 450 mm in expansive clay below clear ground level. Should it be necessary to excavate deeper for solid foundations, the instructions of the Engineer shall be carried out and the extra cost of same paid for at scheduled rates.

Trenches must be plumb and straight, bottoms level and solid, stepped as required and free of water and organic matter.

2.3 SOIL BEARING CAPACITY

Unless directed otherwise the Contractor is to test the soil load bearing capacity and to advise the Engineer if the capacity is less than 300 Kpa and of any concerns he may have in respect of ground conditions.

2.4 REMOVAL OF WATER & ORGANIC MATTER

Water and organic matter shall be entirely removed from the excavations before the placement of concrete in foundations and the excavations must be kept substantially free of water and organic matter from that time until concrete is placed and set.

2.5 BACKFILLING

Backfill shall be clean filling material free from rubbish and organic matter. Backfill shall be well rammed in 150 mm layers and compacted to the same degree as the original undisturbed ground. Backfill shall be brought up to the original ground level or to the levels shown on the drawings.

2.6 SURPLUS SOIL

Stockpile any surplus soil on the site in a location approved by the Employer.

2.7 GRADING AND LEVELLING

On completion of the building operations, grade and level the site to even falls and ensure that surface drainage functions and that surroundings are left clean and tidy.

SECTION 3 - CONCRETE WORK

3.1 MATERIALS

Cement shall be ordinary Portland cement complying with NZS 3122.
Aggregate shall comply with the requirements of NZS 3111.
Water used shall be drinking quality.
Reinforcing steel shall comply with the relevant NZ Standards NZS 3402, NZS 3104, NZS 3421.

3.2 FOOTINGS

All footings shall be cast in formwork and reinforced as detailed.

3.3 HARDFILLING AND BASECOURSE

Hardfill shall be quarry basecourse material suitable for load bearing while providing free drainage when compacted. Beneath concrete slabs, etc. provide basecourse to the extent shown on the drawings. Blind the surface of the basecourse with coarse sand so as to provide a smooth, even and unyielding surface to the damp-proof membrane.

3.4 VAPOUR BARRIER

Lay vapour barrier, Duroid Dampgard or equivalent under all internal floor slab. Laps joints a minimum of 150mm and seal with 50mm wide moisture resistant, pressure sensitive tape. Where pipes pass through the sheet use system/details as specified by manufacturer. Make good any minor holes or tears before concrete is poured to ensure a completely impervious membrane over the whole ground area. Where vertical walls are to be waterproofed, use either three coat bitumous Mulseal or Flintcote type barrier. Install as per manu. instructions and protect with layer of 6mm Hardiflex sheet, to be backfilled.

3.5 REINFORCING

Accurately place all reinforcing where shown on the drawings. Use deformed mild steel rods or reinforcing mesh. Before concrete is placed ensure that the reinforcement is free from loose flakey rust, oil, loose mill scale and paint or anything liable to prevent a proper bond.

3.6 CONCRETE MIX

Only ready mixed concrete complying in all respects with NZS 3104 shall be used on the job. No hand mixing is permitted. Compressive strength for all concrete work shall be a minimum of 17.5 MPa or as otherwise noted on the drawings.
A current grading certificate from the New Zealand Ready Mixed Concrete Association will be accepted as compliance with this standard.

3.7 PLACING OF CONCRETE

Concrete shall be placed, finished and cured in accordance with NZS 3109 section 7. Immediately before any concreting is commenced, formwork shall be cleaned of any debris and dampened down. Remove formwork after the recommended curing time. The engineer shall be given 24 hours notice of concrete pours.

3.8 TOLERANCES AND SURFACE FINISHES

Tolerances shall be as in NZS 3109, table 4, Permissible Deviations

All floor slabs are to be laid to true and straight surfaces, screeded, wood floated and finished with a steel float or power float to a fine finish. Refer also drawings for specific surface finishes where required. Provide falls to wet areas and external paving where required.

3.9 BUILDING IN

Allow to build in all holding down bolts, pipes, wires, etc as required, prior to the pouring of concrete. Holding down bolts to be 150mm maximum from corners and at 900mm centres maximum, or as specified on drawings. Bottom plates fixed with Lumberlok cast-in fixings @900crs max.

Liaise with underfloor heating installer for the placement of in-slab pipe network. Special attention to areas to be sawcut.

3.9.1 INSULATION

Under floor insulation. 25mm minimum, 50mm maximum, confirm with owners, polystyrene insulation sheet installed to on ground slab areas.

3.10 LEVELS

Refer to the drawings for establishing a reference datum when fixing footing and floor levels. Levels shall be checked and approved prior to placing any concrete.

3.11 REINFORCING

Bars 10 mm and larger shall be deformed. All starters shall be located accurately. Any starter bars closer than 12 mm to a face shall be replaced by approved means. Kinking of bars is prohibited.

Vertical Reinforcement: Vertical reinforcement shall be positioned at the centre of the wall or as dimensioned on the drawings. Such bars shall be fixed against lateral movement at the top and bottom and elsewhere as necessary. Approved steel positioning devices will be accepted.

Horizontal Reinforcement: A clear distance of not more than 10 mm between horizontal reinforcement and the masonry face shall be maintained.

General: All reinforcement shall be fully embedded in grout and not in mortar joints.
All laps shall be 40 bar diameters unless otherwise shown on the drawings.
Cover from exterior masonry surfaces shall be not less than 40 mm or 50 mm from surfaces exposed to the weather.

3.12 WAFFLE SLAB

If waffle slab system is chosen the manufacturer shall provide fully designed floor slab plans and details to Local Consent Authority for approval prior to installation.

Client preferred supplier; Poly Palace 0800 725 223

SECTION 4 - INSULATED BLOCKWORK

This section relates to the supply, erection, reinforcement and concrete filling of hollow EPS (expanded polystyrene) blockwork.

Documents

4.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
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.

4.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:
Ambionse

4.3 CONCRETE TESTS

Retain mix design information for plant mixed concrete for inspection. Keep an accurate record of the in-place location of all batches. Carry out tests in accordance with NZS 3104, section 2.15 Control tests and their evaluation.

4.4 BLOCKS

Blocks injection moulded from fire retardant polystyrene beads. Final density between 23 and 26 kg per cubic metre.

Metal bridges of galvanized steel, bonded into each external skin of polystyrene.

4.5 REINFORCEMENT

Deformed and plain steel bars to AS/NZS 4671.

4.6 CONCRETE INFILL

Normal concrete infill with a minimum compressive strength of 20 MPa at 28 days, to NZS 3104 and a slump of between 100 and 120 mm. Maximum aggregate size 14 mm. Supply concrete from a ready mix concrete plant with Certificate of Audit.

4.7 PROP SYSTEM

As recommended and supplied by the manufacturer, for use during erection and the subsequent filling of block cores.

4.8 ALL WORK

All work by a firm approved by the manufacturers and/or distributors of the EPS blocks.

4.9 EXECUTION

Carry out all work using persons skilled in the methods and recommendations laid down by the EPS block manufacturer and in accordance with the manufacturer's technical information on the use of equipment and construction techniques.

Keep a current copy of the EPS block manufacturer's technical manual on site and bring to the attention of all workers during the construction process.

4.10 STORAGE

EPS blocks are vulnerable to damage. Take care to protect blocks during delivery, storage and installation, with particular attention taken to preventing damage to corners and rebates.

4.11 SOLVENTS

Do not allow solvent products to come into contact with EPS blocks.

4.12 CUTTING

Carefully follow the recommendations and requirements set out in the manufacturer's technical manual. Generally cut blocks using a small panel saw or sharp Stanley knife, with a keyhole saw used for reveals and cut outs.

4.13 ACCURACY

All walls true to line, level and plumb and within the following tolerances:

Deviation from plan location:	20 mm
Deviation from vertical within a storey:	10 mm per 3 metres
Relative displacement between load bearing walls in adjacent stories intended to be in vertical alignment:	5 mm
Deviation from line to plan	
- Any length up to 10 metres:	5 mm
- Any length over 10 metres:	10 mm
Deviation from horizontal	
- Any length up to 10 metres:	5 mm
- Any length over 10 metres:	10 mm

4.14 PROPPING

Install a propping system to hold the blocks in place during filling. Bolt props to the floor prior to laying of blocks, and install at all wall corners, and every 2 metres along each wall. Adjust for straightness and plumb. Install soft iron wire ties every fourth course, through the polystyrene, around the metal bridge and back out around the prop.

4.15 ALL BLOCKS

Accurately bed all blocks into the blocks below and to butt accurately against each other, ensuring true wall dimensions are achieved. Do not place webs of blocks over the vertical flue of the block below.

Horizontal joints may be glued with polystyrene contact adhesive on each face, when required to assist stability against wind or construction loads.

Stay all walls against wind and construction loads.

4.16 PLACE REINFORCING

Place and tie reinforcing as detailed and in accordance with NZS 3109. Cut, bend and place reinforcement as shown on the drawings, with cover maintained by the use of plastic or concrete spaces.

Bars lapped only where detailed, with lapping kept to a minimum and staggered wherever practicable.

4.17 BUILT IN ITEMS

Build in all bolts, straps and fixings as detailed and as required. Construct chases, holes, cut-outs and recesses only as and where detailed. Any cast in fixings to have the surrounding polystyrene removed to provide a minimum of 30 mm concrete cover around the fixing.

4.18 CONSTRUCTION JOINTS

Locate construction joints in accordance with NZS 3109. Immediately before placing concrete, wet the construction joint area and apply a 10 mm thick layer of cement slurry to the joint; slurry being either a cement/water paste, or a 1:1 mix of cement and sand. Work the slurry well into the construction joint before placing the concrete.

4.19 INSPECTION

Provide notification that the work is ready for inspection prior to grouting. Do not proceed with grouting until written approval has been received that walls have been constructed and reinforced in accordance with the design documentation.

4.20 CONCRETING

To NZS 3109. Ensure that all cells are clear and clean and all reinforcement is in place. Consolidate infill concrete by rodding with a 16 mm square end reinforcing rod, or by using a small poker vibrator. Height and extent of lifts and sectional lifts to be strictly in accordance with the EPS block manufacturer's technical manual.

4.21 WIRE TIES AND PROPS

Once the concrete infill has cured, cut off all wire ties level with the polystyrene surface. Carefully dismantle and remove the prop system.

4.22 CLEANING
Both during laying and on completion, clean down all exposed block surfaces to remove adhesive or concrete splashes.

4.23 MAKE GOOD
Make good any damaged corners or faces using acrylic cement plaster.

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

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

4.26 EPS BLOCKS
Manufacturer: Ambionse
Series: 250

4.27 PLASTERING AND COATING

This relates to Stoanz Ltd Sto EIFS plaster rendering systems, applied by hand, or pump over EIFS polystyrene cladding. Stoanz Ltd products must be installed by an approved applicator.

DURABILITY
The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years. Refer to the following:
BRANZ Appraisal Certificate No 478 (2005)

ON GOING MAINTENANCE INSTRUCTIONS
Provide details of ongoing maintenance required to meet the performance requirements of the NZBC B2 Durability.

DOCUMENTS REFERRED TO
AS 1366.3 Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1366.4 Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Extruded (RC/PS - E)
NZBC B2 Durability.
NZBC E2/AS1 External moisture
Wanz Wis: Window installation system
BRANZ Appraisal Certificate No 478(2005) Sto Therm and Sto Therm Classic Plaster System

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

MANUFACTURER'S DOCUMENTS
Stoanz Ltd documents relating to work in this section are:
Sto Product Manual with specification and CAD details
Sto Technical Data Sheets

Materials and execution to Stoanz Ltd specification except where varied by this specification and supported by architectural detailing.

Copies of the above literature are available from:
Web: www.sto.co.nz Building with Sto
E-mail: info@sto.co.nz
Telephone: 0-4-801 7794
Fax: 0-4-384 9828

ABBREVIATIONS

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

EIFS	Exterior Insulation and Finish Systems	
EPS	Expanded Polystyrene	
MPNZA	Master Painters New Zealand Association	
WANZ WIS	Window Association of New Zealand	Window installation system

NO SUBSTITUTIONS
Substitutions are not permitted to any specified Sto render system.

QUALIFICATIONS
Use only applicators registered to apply the Sto render systems.

FINISH SAMPLE
Submit one 300 mm x 300 mm standard panel of the selected finish texture and colour for approval. Obtain signature of acceptance on sample and return to the approved applicator.

MAINTENANCE INSTRUCTIONS
Provide Sto Maintenance Schedule instructions before practical completion of the contract for issuing to the building owner.

HEALTH AND SAFETY
Refer to the requirements of the Health and Safety in Employment Act and OSH: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put into place procedures for dealing with emergencies. Obtain from Stoanz Ltd the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

PRODUCER STATEMENT
Provide a producer statement from the approved Sto applicator in the form as required by the Building Consent Authority.

WARRANTY
Warrant this part of the work under normal environmental and use conditions against failure of materials and execution. The approved Sto applicator must complete the Sto quality assurance compliance procedure form and applicator warranty. The Sto Therm and Sto Therm Classic Plaster Systems are warranted as follows:

Materials:	15 years from date of practical completion
Execution:	5 years from date of practical completion

PERFORMANCE
Accept responsibility for the structural and weather-tight performance of the exterior render application.

PROTECTION OF NEW PLASTER
Provide protection systems as required by the manufacturer to protect fresh plaster from adverse weather conditions.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by NZS 4203 or AS / NZS 1170.

INSPECTIONS
Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing.

If requested permit representatives of Stoanz Ltd to inspect the work in progress and to take samples of their products from site. Refer to Sto product manual.

STOARMAT RFP / MESHED REINFORCEMENT PLASTER.

Cement free reinforcing coat with calibration grain in a pail. Containing mineral quartz, flours, fillers and fibre bound in an acrylate polymer dispersion with enhancement agents.

STOLASTIC COLOR COATING
Satin matt coloured dispersion paint. Special low sheen elastic coating, UV cured for dirt resistance, vapour permeable with excellent resistance to weathering and stress. Refer to SELECTIONS for colour.

STO CAVITY BATTENS
H grade EPS castellated self adhesive cavity battens.

STO QUADER BOARD
Non compressible anchor board for supporting penetrations through the cladding.

FLASHINGS
Head jamb sill and any other required flashings made from powder coated aluminium, stainless steel or uPVC for both recessed and faced fixed timber, aluminium and uPVC joinery to NZBC E2/AS1.

STO FLASHINGS & COMPONENTRY
Sto uPVC Flashings are to be used for weatherproofing the exterior plaster at transitions, junctions, terminations and for forming corners and drip edges.

STO FLEXYL WATERPROOFING
Waterproof membrane conforming to AS/NZS 4858 for waterproofing balustrades, horizontal ledges and foundation splash zones.

VERTICAL CONTROL JOINTS
8 mm – 12 mm uPVC vertical control joints.

STO JOINT SEAL TAPE
An expanding polyurethane foam impregnated inseal tape for weatherproofing joints.

STO ADHESIVE FOAM
For filling any voids in sheet joints.

SEALANT
BRANZ appraised modified MS sealant.

STO SPIRAL FIXINGS
For fixing fitments that have a total face load of less than 8 kg.

CLADDING FIXING NAILS
40 mm cladding: 90 mm x 3.55 mm galvanized flathead nails with Sto yellow washers.

DELIVERY
Keep Sto bagged plaster products dry in transit. Take delivery of Sto plaster products in good condition. Reject all damaged materials and immediately notify supplier in writing.

STORAGE
Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Keep bagged render dry and off concrete surfaces.

PLASTERING CONDITIONS
Carry out plastering to Stoanz Ltd specification under conditions which will not adversely affect the finished work.

PROTECT
Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

SUBSTRATE

Ensure the main contractor and the sub trades are aware of their responsibilities relating to the required provision of weather tight details at all junctions, penetrations and transitions including any blocking required for support (see www.sto.co.nz for details).
Do not commence work until required openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed, flashings and other preparation are complete, and the building underlay has been securely fixed. Do not commence plastering until substrate is of the required standard by the Stoanz Ltd approved applicator. All defects in substrate must be rectified prior to application of plaster coatings commencing.

CONFIRM LAYOUT
Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

STO EPS CLADDING
Fit the Sto vented foot tray to bottom plate and then fix EPS sheets over Sto cavity battens. All fixings centres are to be set out as per the Stoanz Ltd standard fixing layout complying with the specified wind zone. Fixings shall be driven in 2 - 3 mm below the surface of the EPS sheets. Sheets shall be fixed with Sto cladding fixings at maximum 300 mm centres for 400 / 600 mm framing centres with one fixing per nogging, except in very high wind zones, fixings shall be at 200 mm maximum centres on plates, studs and noggings. Sheet joints shall be straight and true. Joinery is flashed using the Sto uPVC 40 / 60 mm cavity jamb and sill flashings, installed as per the Sto CAD details. Where Wanz Wis joinery support bracket is used a Sto uPVC 40 / 60 mm faced fixed jamb and sill flashing will need to be used at the sill to accommodate the bracket.
As required fit Sto Quader Blocks for taps, fittings, handrails and any other fixture.

IRREGULARITIES
Nail holes and minor surface defects to be stopped flush with Sto Levell Uni mix before the Sto Levell Uni or StoArmat RFP base coat is applied. Sheet joints and gaps are to be Sto adhesive foam flushed.

INSTALL uPVC FLASHINGS
Adhere to the Stoanz Ltd flashing details. Install all Sto uPVC joinery flashings, head vented vermin trays, vented foot trays and end caps using an EPS safe construction adhesive as required.

PENETRATIONS
Comply with the Stoanz Ltd flashing details. All penetrations such as waste pipes, electrical wiring in uPVC conduits and metal plumbing piping install with a minimum 5° downward slope, through the Sto plaster system, to be sealed using a double application of MS sealant.

CONTROL AND EXPANSION JOINTS
Where shown on the drawings and to Stoanz Ltd requirements insert Sto flexible uPVC V control joints vertically and where the cladding abuts different cladding types. Reflect exposed control joints through final coatings from substrate. Terminate the plaster reinforcing mesh each side of the Sto flexible uPVC control joint. Vertical control joints are required in EIFS walls longer than 20 metres. Horizontal joints are required at maximum 6 metres centres excluding gables.

Form horizontal inter-storey closed cavity joints at third storey level using a metal flashing with a 15° outward slope.

SEALANT INSTALLATION
All junctions between joinery / adjacent surfaces / differing materials sections and the mesh coat, and around penetrations shall be sealed with MS sealant.

PARAPETS / BALUSTRADE TOPS AND HORIZONTAL PLASTER SURFACES
A metal capping with a minimum slope of 5° slope is required on roof parapets. On horizontal plastered surfaces a minimum slope of 10° is required. On balustrades a polystyrene 10° shape is normally used as a capping. Apply Sto Flexyl / Mesh coat to a minimum thickness of 1.5 mm followed by StoArmat RFP mesh coat and Sto plaster finishing coats. Sto Flexyl must be extended 75 mm up and down adjacent vertical plaster surfaces.

FINISHING
Refer to SELECTIONS for type and colour.

Sto Therm Plaster System

MESHED REINFORCEMENT PLASTER
Apply one even coat of StoArmat RFP reinforcement plaster at approximate thickness 1.5 - 2 mm. While plaster is still wet lightly embed Sto mesh ensuring adjacent drops of mesh are overlapped by a minimum of 75 mm. Float surface to ensure mesh is lightly embedded into the StoArmat RFP reinforcement coat. Allow to dry and apply one further coat of StoArmat RFP reinforcement plaster at approximately 1 - 1.5 mm thick to leave the plane even surface free of voids or deviations. Ensure all joinery openings are meshed. Once dry remove any slight ridging with a Sto rasp ready for topcoat.

FINISHING RENDERS
To all exterior plastered surfaces apply Sto Stolit reinforced coloured render tinted to the selected colour, applied with a steel trowel gauging to the thickness of the aggregate size and finished with a plastic trowel to the requisite pattern.

PAINT FINISH
Apply one coat of StoColor Maxicryl matt facade paint or StoLastic Color satin matt paint tinted to the select colour.

CLEANING
Remove debris, unused materials and elements from the site relating to plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

FINAL INSPECTION
A final inspection by project assessor of the entire finished plaster system to take place immediately after completion of the application work and any defects or subsequent damage made good immediately.

STO THERM CLASSIC PLASTER SYSTEM SS106

Location:	To all EPS and Ambionse walls
Substrate:	40 mm EPS H grade or Ambionse Block
Base coat:	LevelLite
Mesh coat:	StoArmat RFP
Mesh:	Sto glass fibre mesh
Levelling coat:	StoArmat RFP
Finishing plaster:	To owners final selection
Coats:	One
Colour:	To owners final selection.

SECTION 5 - CARPENTRY

5.1 WORKMANSHIP

Work shall comply with methods, processes and practices covered by trade certificates in carpentry and joinery and New Zealand Building Code and relevant NZ standards and in particular NZS 3604, NZS 3640, NZS 3602.

5.2 TIMBER GENERALLY

Shall conform with NZS 3604, NZS 3640 & NZS 3602 unless otherwise specified or shown on the drawings. Permitted defects are those limited to those in NZS 3631. Moisture content of the timber framing shall not exceed 16% at the time of lining. Refer to drawings for structural framing grades. Refer Trade manuals for procedures, installation details and specification for all proprietary components.

Refer to the following timber treatments where relevant;

External wall framing. H1.2
External Cavity battens. H3.1
Internal wall framing H1.1 EXCEPT where framing shower/bath walls which are tanked framing shall be H3.2.
Roof framing/rafters H1.2
Roofing members to enclosed spaces or less than 10 degree pitch. H3.1
Trusses H1.1
Valley boards H3.2
Misc. External trim timbers H3.2
H3.1 pre-primed fascias & barge boards.
Interior Plywood H1.1
Plywood Wet area walls/flooring H3.2
Plywood Exterior/soffits/roofing substrate H3.1
Plywood exterior substrate to veneer H3.2
Piles H5 Tanalised
Deck Bearers H3.2
Deck joists H3.2
Bearers H1.2
Floor joists H1.2
Floor joists wet area H3.1
Decking H3.2 Radiata

If in doubt over the treatment levels and application, consult with designer prior to order/installation.

5.3 PROTECTION

All timber shall be properly stacked clear of the ground upon arrival at the site to allow ventilation and prevent distortion in any way, and shall be adequately protected from the weather and other possible causes of damage.

5.4 FASTENINGS

All nails, bolts, etc. for exterior work shall be galvanized, except where fasteners are within 600mm of unprotected ground, all fixings shall become stainless steel. Refer to drawings for other locations of stainless steel fixings.

Generally secure all timbers and sheet linings as per Appendix A - Nailing Schedule NZS 3604 or to the manufacturers recommendations where applicable. Provide also all plates and straps as shown on the drawings and as required to complete the installation. Fix as shown on the drawings and in accordance with NZS 3604.

5.5 PRIMING

Prime all those timbers required to be painted. Those surfaces abutting other building materials, e.g. concrete shall be primed on all faces, backs, joints and end grain.

5.6 DAMP PROOF COURSE (DPC), VAPOUR BARRIERS AND BUILDING PAPER & FLASHING COMPONENTS

A DPC of 2 ply bituminous fabric shall be placed between all timbers, plates, etc., and concrete and masonry.

Pre - Window & Door installation requirements. Refer to E2/AS1 and refer also to WANZ WIS for windows into pre-cast panels and timber framing with metal claddings.

Sheath exterior framing with TYVEK HOMEWRAP breather type building paper of approved manufacture and to comply with NZS 2295. Lay horizontally in single lengths lapped a minimum of 150 mm at joints. Diagonal cut paper at openings and fold around exposed trimming frame, secure with staples. Fit TYVEK FLEXWRAP 200mm min up studs across sill frame. Install also 200mm long in each direction to jamb & head to top corners, covering all exposed timber work. Refer to drawings for specific requirements where Second layers of wrap are required to be installed with Flexwrap. Where required allow also for the fitting and installation of additional flashings, sill trays, stop ends etc to ensure watertightness.

Install foam sealer to 5mm gap perimeter of all window/door openings on the internal side as required by E2/AS1.

5.7 WALL FRAMING

Framing shall be spaced at a maximum centres as detailed on the drawings. Where engineered wood systems are specified, refer to manufacturer's specifications and literature.

Load bearing Bottom plates shall be fixed with suitable 6kN fasteners @900crs max, starting 150mm max. from wall ends. Internal non-load bearing walls fixed with mechanical fasteners @900crs max, starting 150mm max. from wall ends. Bracing walls to be fixed with 12kN fixings as detailed in bracing systems specifications.

Maximum spacing of noggings in stud walls shall be a maximum of 1200mm centers. Please note that some claddings require closer noggings. Space noggs at centers as required for the application of interior linings & external claddings to that particular wall.

Provide all attendance, nogging, solid backing for other trades. Check drawings for items such as recessed lights, plumbing or hardware fittings and the like and trim out or provide solid backing as required.

Where ceiling linings are specified the maximum spacing of fixing batten, joist, rafter or purlin to which the lining is fixed shall be 400 mm centres. All sheet materials shall be fixed horizontally unless specifically stated otherwise.

Provide lintels to all openings in accordance with NZS 3604 or as detailed on the drawings. Bracing shall comply with NZS 3604.

Generally the requirements of NZS 3604, 3602, 3640 are minimum standards together with NZS 3631 Timber Grading. Refer to drawings for specific details.

Nog for and build in the various fittings as supplied under "Plumbing" and "Joiner" and trim around with splash boards primed and set in mastic and other finishing trim and mouldings as required.

All nails in exposed (interior and exterior) work are to be punched.

5.7.1 DECKING

If tiled decking on Jacks not selected then the following timber application will apply.

Decking shall be ex 100 x 25 Kwila griptread laid without gaps between. Fix with annular grooved galv. Nails, lengths to suit. Decking shall be applied with selected stain finish. Apply at least one coat to three sides of decking prior to construction.

Special attention to be paid to raft decking construction. No metal fixings are to penetrate timbers or any sharp protruding edges that may damage membrane.

Decking joists shall be cut to tapers to allow for level deck platform.

Deck joists shall be fitted over NuraPads @1200crs max over Nuraply membrane.

5.8 ROOF FRAMING

All roof members shall be well spiked together and to bearing members. Roof shall be adequately supported, strutted, tied, nogged, and braced to prevent any movement, deflection or uplift in wind. Refer to drawings for types and locations of fixings for rafter to top plate, top plate to studs and lintel fixings. All other nail type fixings shall be in accordance with NZS3604.

Where trussed roofs are shown, these shall be specifically designed By MiTEK and the truss manufacturer shall provide all details to the Local Authority's approval. Architectural drawings show suggestive layout only and will be subject to modification by MiTek.

Cut and modify extg roof structure to allow for new structure to be inserted. Temporary support all extg structure until new structure in place and fully secured/braced.

5.9 EXTERIOR FINISHING
Refer to Ambionse section for external plastering.

5.9.1 SOFFITS
External soffits shall be 12mm grooved face Plywood, prepared for paint finish.

5.10 FLOORING

Refer to manufacturers literature for structural floor joists selections and installation, fixing details.

19mm Plywood structural flooring system, fixed with suitable adhesive and screw fixed according to manufacturers specifications.

5.11 WALL LININGS
Scope.
All internal walls shall be Gib board lined. Where internal timber framed walls are shown these shall generally be lined with Gib board.

Interior wall linings generally to be 10mm standard Gibraltar board sheets, recessed edge fixed in longest possible lengths, with horizontal joints. Direct fix to Ambionse walls with suitable wall-board adhesive and to timber framing with Gib adhesive & proprietary tool fixed Gib screws, double screwed to studs and nogging.

Sheets to be used as bracing panels must be fixed at 150 mm crs around the perimeter with the appropriate scews, and as per manufacturer's recommendations.

Bathrooms and utility room linings shall be 10mm Gib Aqualine prepared for paint finish, and installed according to manufacturer's instructions.

5.11.1 INTERIOR GIB PLASTER

All Gib walls and ceilings visible (excluding, wardrobes and cupboards) shall be level 5 finish as detailed in Gib manual. Refer to Gib plastering literature.

Typically all joints and interior angles shall have tape embedded in joint compound and one separate coat of joint compound applied over all joints, angles, fasteners heads and accessories. A thin skim coat of air drying joint compound, (or a material manufactured especially for this purpose) should be applied to the entire surface. The surface shall be finished smooth and free of tool marks and ridges.

Workmanship of the highest skill is necessary to achieve this quality and shall be carried out by an experienced plasterer.

Use proprietary Gib Beadex or Goldline mouldings in all applications for negative details, external and internal corners.

Gib wall to Gib ceiling junctions shall be square stopped.

5.11.2 CEILING LININGS
Scope.
Ceiling linings shall be 10mm Ultraline fitted in longest possible lengths, except;

10mm Gib aqualine ceilings to bathrooms and utility room.

10mm Gib standard to garage.

5.12 INSULATION

Provide fibreglass batts to all external walls and ceilings where accessible during construction, and to internal walls where shown on drawings. Refer to Pink Batts literature.

Ceiling insulation shall be Pink Batts R3.2
Insulate all internal floor spaces with R1.8 Pink Batts.
Internal wall insulation shall be Pink Batts R1.8.

Install to manufacturers instructions. Batts shall form continuous barrier, with no gaps.

5.13 FIREPLACE

To owners final selection, otherwise, Rinnai Arriva classic fireplace, finished in matt black. Install complete with all accessories as required to complete the installation.

5.13.1 GAS SUPPLY

Allow for the supply and installation of gas bottles for connection to Gas fireplace and Gas cooking hob in kitchen. Locate in position as shown on the plans to comply with Gas installation regulations and relevant NZ standards.

5.14 FINISHING TIMBERS

All new skirting shall be paint quality FJ Radiata products to the following dimensions.

Skirting	-	ex 75 x 10	Square dressed

All architraves to be fitted to window and door joinery shall be selected to match the timber types used in the interior faces of joinery units.

5.15 SHELVES & RAILS

Except master wardrobe, wardrobes shall have 300mm deep timber shelf @1700 a.f.l running full width of w/r. Powder coat finished 'J'hanging rail to be fixed to front of shelf. Provide all necessary supports and fixings as required to complete the installation.

Cupboards shall have 5 rows of slatted timber shelves @300crs starting 600mm afl.

5.16 GLUELAM CURVED BEAM

Manufacturer gluelam beam to curve as shown on plans and construct beam as per engineers design. Beam to be fixed at each end to cantilever joists with proprietary hanger fixings.

5.17 BARRIERS

Where shown on plans allow for the supply and installation of wrought iron barriers. Barrier designs shall be owners final design style selections. Barrier designs shall comply with NZBC F4.

Barriers shall be installed according to manufacturer's specifications ensuring they meet the minimum requirements of the NZBC; Safety from Falling.

5.18 VELUX ROOF WINDOWS

In positions shown on the drawings install new Velux Skylights unit type FS304. Trim out roof structure, care required to cut out neat trim size to suit. Install complete in proprietary Velux flashing system as required for roofing type & pitch. Refer to trade literature section of this specification for manufacturers installation details.

5.19 GARAGE DOOR

Install ex 150 x 25 TG & V Western Red Cedar panel sectional garage door. Complete auto sectional door with 2 x remotes per door.

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind and seismic load performance requirements to NZS 3604, table 5.1, AS/NZS 1170 and NZS 1170.5

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

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

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

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

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

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

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

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

5.20 LIFT

In the position shown on the plans, allow for the complete supply and installation of ACCESS ELVEVATORS LTD, Hydraulic platform lift.

Refer to technical literature for all details to complete the installation. Confirm all finishes with owners prior to order.

SECTION 6 - WOOD JOINERY

6.1 WORKMANSHIP

Only skilled joiners shall do the work in properly equipped joinery workshops. Recognised jointing methods shall be used throughout with concealed nailing or screwing. Properly clamp glued members.

Nail in exposed surfaces shall not be used and secret fixing methods used instead. All doors, shelves, etc. where made of coreboard or particleboard, shall be clashed at edges. All joinery wood surfaces shall be sanded to a fine finish. Supply all beads and storm moulds required, avoiding joins where possible.

Properly frame and support all members so that movement is avoided. Allow satisfactory clearances for doors, drawers, sashes.

Generally framing shall be strongly assembled, jointed, glued to give a heavy duty result in accordance with the best trade practice. Scribe fittings neatly to the walls and floor. Provide concealed hinges, handles as scheduled and all other locks, beads, fixings etc as required to complete the installation.

Ensure joinery is adequately constructed to suit its intended purpose

6.2 TIMBER GENERALLY

Generally all timber for frames, trim, facings etc. shall be Pinus Radiata, Dressing No. 1 grade. Refer to drawings for further details and special finishes sections and profiles, or members required. and to 'Painting' section for surface finish required.

All timber shall be selected from dry stock, free of knots, shakes or other defects. Select window and door frames for straight grain.

All timber shall be air or kiln dried to the following moisture content:

Exterior joinery and finishing timbers (excluding doors)	17 - 20%
External doors	15 - 20%
Internal doors, joinery, finishing timber	12 - 14%

6.3 DELIVERY AND PROTECTION

No joinery shall be delivered to the site until it is required for fixing unless adequate approved dry storage can be provided on site. The joinery shall be kept under a waterproof cover during transit and shall be handled and stacked carefully and protected from damage at all times.

6.4 WINDOWS

Aluminium windows shall be as specified in 'Aluminium Joinery'.

Allow to build in flashings around windows to ensure watertight installation.

Refer to 'Glazing' for details of glass.

6.5 DOORS.

Internal doors
Internal door frames shall be selected natural timber, solid 30 thick by full width of timber walls for architrave finish unless detailed otherwise. Refer to drawings for and sizes. Flush doors shall be Plyco selected natural timber veneer hollow core flush interior doors. Clashed matching natural timber vertical edges. All door hweights Standard 2000 high by widths as shown on the drawings.

Cavity Slider
All cavity sliders shall be Cavity Systems. Refer to drawings for general locations and sizes. All doors to be selected solid timber and some with glazed panels. Glass panels shall be A grade safety glass.

Feature doors
Refer to drawings for general design dimensions description.

W01 - front entry door. In Eurovision Al-timber frame.
Solid ex 200 x 50 TG & V butt Western Red Cedar panel doors. Rebated meeting edges with mohair seal. One leaf shall be fitted with lever handle and locking mechanism and the other panel shall be flush bolted top and bottom.

D03.
Internal bi-fold doors to mezzanine opening. Solid Western Red Cedar frames with fixed louvers infill panels, fitted within Henderson type top hung track and bottom guides on the outside face of barrier handrail. Ensure adequate clearance between barrier and bi-folds.

External Shutters
Refer to drawings for the location and dimension of solid Western Red Cedar framed, fixed louvre shutters, to be fitted outside of selected window and door openings. Fit shutters with custom stainless steel hinges, which allow shutters to fully fold back against walls. Allow for secure mechanisms for the open and closed positions. Confirm details with owners prior to manufacture.

6.6 BUILT IN FITTINGS

Joiner shall prepare shop drawings and consult with designer and owners for approval of all materials and details prior to manufacture. Owners will supply appliances to kitchen. Manufacture of joinery shall liaise with owners for the fitting of appliances to joinery items and delivery to site as a complete installation.

Kitchen
Refer to drawings for general description and design of units. Appliances supplied by owner.

Fireplace Unit.
Refer to drawings.

Built-in shelving and desk unit.
Refer to drawings. Liaise with ownder for final design and materials.

Stairways.
Refer to drawings. Stairs to manufactured off site to good trade practice. Confirm stair materials with owners prior to manufacture. Stairs shall be chocked, blocked, rebated, glued and screwed to ensure a stable and squeak proof construction. Handrails shall be selected 50mm dia timber on proprietary satin chrome brackets as shown on the drawings.

6.7 WOOD TRIM

Refer to Carpentry section. Architrave's, skirting, beads, and the like shall be installed as standard profile and sizes unless otherwise detailed on the drawings. Mitre at angles and use maximum lengths available. Fix with small brads, punch home with fine punch and avoid hammer marks. Trim damaged on the face shall be avoided. A first class surface for paint or varnish is required. Where trim is not expressly shown or detailed, supply and install stock mouldings to all areas where trim is necessary or normally required.

SECTION 7 ALUMINIUM JOINERY

7.1 SCOPE

Refer to the drawings for extent, location and details of aluminium windows and doors required. The following specification is a minimum requirement, for supply and installation of same. Refer trade literature section for information relating to EUROVISION JOINERY.

7.2 STANDARDS

Aluminium joinery shall comply with the requirements of NZS 3504 'Aluminium Windows' and NZS 1900 as applicable to the windows performance, and NZS 4211 'Performance of Windows'. Refer also to the requirements of E2/AS1 and WANZ WIS literature. Refer also to Section 5.6 of this specification.

7.3 FRAMES

The Aluminium joinery shall be EUROVISION with selected natural timber internal facings. Units as shown on the plans shall have inward opening door and windows. All glazed joinery units shall be double clear glazed except those shown with feature red glazed inserts in parts. Aluminium units shall be of suite suitable to fit double glazing with a minimum air space between glazing of 12mm.

Where wood liners are not specified, sections for frames shall be of heavy enough profile and gauge as could fit adequately into the building structure without the aid of wood liners. Mullions or transoms whichever is the shorter, over 1200 mm in length shall have box stiffeners designed for the required span, and in one unbroken length.

Full length joinery units will not be fitted with bottom timber liners. Allow for tidy grout lines between rebates and joinery.

The aluminium joiner shall liase with the timber joinery for the manufacture and supply of the front entry door to be incorporated into the joinery as a complete unit.

Corners shall be accurately mitre cut, and assembled with stainless steel screws into aluminium corner blocks giving a neat, tight fitting joint. All joints shall be completely sealed with an approved non-setting thin joint sealant.

7.4 SURFACE FINISHES

All finishes shall be applied under accurately controlled conditions by recognised applicators. Surface films shall fully cover the material. Base metal shall have polished or equal surface.

7.5 ACCESSORIES

All windows and doors shall be supplied complete with stays, fasteners, handles, deadlocks, catches or closers, draught excluders, necessary to complete the installation. All Aluminium Joinery shall have selected hardware in Satin chrome finish. All handles to doors shall be lever type.
Accessories shall be screw fixed. Riveting will not be accepted.

7.6 BLANK

7.7 INSTALLATION

The aluminium joinery sub-contractor shall install his own units and supply all fixings and waterproofing accessories thereto. Installation shall include for effective water barriers such as support shelves, flashings and sealants. It is the joiners responsibility to notify contractor of any problems or lack of flashings/detailing that does not meet requirements and good trade practice.

7.8 GUARANTEES

A minimum of two year guarantee in the names of the manufacturer, coating applicator and fixer is required covering the surface finish and weather resistance of the windows installed in the final position.

SECTION 8 - ROOFING

8.1 SCOPE

This section covers the supply and fixing of all roofing, flat and pitched roofs, including flashings, ridge capping and valley gutters, external gutters, penetration flashings and associated flashings and membrane roofing and metal wall claddings as shown on the drawings.

8.2 CLAY TILE ROOFING

This section relates to proprietary interlocking clay roof tiles complete with underlay, battens, accessories, fixings and mortar.

DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E2/AS1 External moisture
- 8.0 Roof claddings
- 8.2 Masonry tiles

AS/NZS 1170.2 Structural design actions - Wind actions
AS 2049 Roof tiles
AS 2050 Installation of roof tiles
NZS 3604 Timber framed buildings
NZS 4203 General structural design and design loadings for buildings

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.

8.1.1 MANUFACTURER'S DOCUMENTS

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

Ross Roofing
Telephone: 09 299 9210

8.1.2 QUALIFICATIONS

Carry out all tiling work with experienced competent installers familiar with the products being used.

8.1.3 WARRANTY

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

Warranty period - materials: 5 years
Warranty period - execution: 5 years

8.1.4 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by NZS 4203 or AS/NZS 1170.2.

8.1.5 CO-ORDINATE

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

8.1.6 PERFORMANCE

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

8.1.7 BATTENS

Type: Radiata pine, No 1 framing
Treatment: H3.1
Up to 430 mm: 50 mm x 25 mm
430 mm - 600 mm: 50 mm x 37 mm
600 mm - 900 mm: 50 mm x 50 mm

BIRDPROOFING

Galvanized wire netting 13 mm hexagonal mesh 0.70 mm wire gauge.

UNDERLAY
Breather type flame proof kraft paper laminates.

CLAY AND TERRACOTTA TILES
Selected pressed and kiln fired, complete with capping and barge tiles to AS 2049.

NAILS
Hot dipped galvanized steel clouts 2.5 mm diameter penetrating the batten by 20 mm minimum but not through it.

SCREWS
Stainless steel roundhead screws 2.5 mm diameter with neoprene washer.

CLIPS
Hot dipped galvanized steel tile clips with galvanized 2.5 mm diameter clout fixing.

RIDGE CLIPS
Hot dipped galvanized steel adjustable clips with galvanized 2.5 mm diameter clout fixing.

MORTAR
4:1 - Sand: cement with plasticiser added to the tile manufacturer's requirements.

POINTING
3:1 - Sand: cement with pigment added to the tile manufacturer's requirements.

INSPECTION
Inspect the roof framing and supporting structure and do not start work until it is complete and fully braced ready for tiling, to the requirements of NZS 3604.

STORAGE
Stack on level hard standings and protect from damage and inclement weather.

HANDLING
Unload and handle tiles without soiling, chipping or other damage.

MORTAR
Discard any mortar not used within 30 minutes of mixing.

COMPLY
Lay and fix clay tiles to AS 2050 and NZBC E2/AS1: 8.0 Roof claddings, 8.2 Masonry tiles.

GENERAL
Carefully set out the roof with a gauge rod to position the battens taking account of rafter lengths, minimum head lap, overhangs into gutters and spoutings, and verge overhangs all to minimise tile cutting.

LAY UNDERLAY
Lay building paper dished 40 mm across the roof framing starting at the eaves with 150 mm minimum laps. Lay over fascias, anti-ponding boards and verges and turned up against penetrations and vertical faces. Fix to the tile manufacturer's requirements and to AS 2050.

FIX BATTENS
Fix battens in straight courses evenly spaced between fascia and ridge and elsewhere, to avoid cut tiles. Tightly butt joint over rafter or counter batten with joint locations staggered to give at least 2 continuous battens between those jointed on the same member. Neatly mitre to hip rafters and valley battens. Nail to and skew nail joints to supporting members, to AS 2050 and NZS 3604.

LOADING
Complete sarking, counter-battening and battening over the whole roof before any tiles are loaded.

LAYING
Lay courses straight and parallel and with set-out and locking to AS 2050 and NZBC E2/AS1: 8.0 Roof claddings, 8.2 Masonry tiles.

NAIL FIXING
Nail all tiles to eaves and top courses to the tile manufacturer's requirements.

CLIP FIXING
Clip all tiles to eaves and top courses and alternate tiles to all other courses in those areas of the roof that require clip fixing for handling high winds and rain in exposed environments to the tile manufacturer's requirements.

RIDGE FIXING
Screw fix ridge tiles to the tile manufacturer's requirements.

FORM VALLEYS
Machine cut tiles to a neat, clean line leaving a minimum gap of 100 mm. Form and fix birdproofing to valley battens. Fix all cut tiles.

FORM RIDGES AND HIPS
Support and bed edges and joints of ridge and hip tiles in mortar to the tile manufacturer's requirements.

ANTI-PONDING BOARDS
Install anti-ponding boards to NZBC E2/AS1 : 8.0 Roof claddings and treated to NZS 3602 at a minimum fall of 5 degrees to clay tile roofs with pitches less than 17 degrees.

SAW TOOTH RIDGE
Use purpose made ridge to the tile manufacturer's requirements.

FINISH VERGES
Use gable end barge tiles to the tile manufacturer's requirements. Butt standard tiles and half tiles up to secret gutters to the tile manufacturer's requirements.

ABUTMENTS
Where unavoidable, machine cut tiles to a neat, clean line to detail and to allow a full dressed down flashing.

POINTING
Point bedding mortar to ridges, hips and verges to a smooth, straight weathered face.

EXPOSED CUTS
Coat the exposed cut surfaces of tiles to match the tile face.

FIT FLASHINGS
Where detailed or required in order to complete the works, allow to incorporate asll flashings as required.

PENETRATIONS
Flash and overflash all penetrations through the roof.

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).

REPLACE
Replace damaged or marked elements.

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.

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

CLAY AND TERRACOTTA TILES
Brand: Ross Roofing
Profile: Royal Coppo
Colour: Natural Terracotta

FLASHINGS AND OVERFLASHINGS
Colour matched or painted as required.

PROPRIETARY POINTING COMPOUND
Brand/type: As per Ross Roofing recommendations

8.3.1 GUTTERS & DOWNPIPES

All external gutters shall be Coloursteel quarter round. Gutter fixing brackets shall be exposed, evenly spaced at centres as required and fixed according to manufacturer's instructions. Provide minimum falls to location of down-pipes as shown on the drawings.

Down-pipes shall be dia as shown PVC with spray paint finish to selected colour (zincalume match). Down-pipe brackets shall be PVC with spray paint finish also and installed at centres as required and to good trade practice. Down-pipes shall terminate above ground level, above soak-away discharge pipe. Down-pipes discharging onto another roof shall have a spreader of at least 300mm long according to E2/AS1.

8.4 NURAPLY 3P TORCH-ON MEMBRANE ROOFING

DOCUMENTS
Documents referred to in this section are:

BRANZ Bulletin 345: Flat membrane roofs - design and installation
BRANZ Bulletin 346: Flat membrane roofs - 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.

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:

NURALITE Accreditation NZBC E2 Alternative solution
NURAPLY 3P brochure BRANZ May 2000.
NURAPLY Systems design and specification manual
NURALITE Waterproofing LIMITED: CAD drawings 1 – 7.
Copies of the above literature are available by phoning NURALITE Waterproofing LIMITED, Phone 0-9-579 2046 or 0-4-385 9326. Refer also NURALITE Waterproofing LIMITED website www.nuralite.co.nz.
QUALIFICATIONS
Roofing to be carried out by competent workers licensed by NURALITE Waterproofing LIMITED and experienced with NURALITE materials and the specialist techniques. Provide on request evidence of experience prior to commencing work.

WARRANTY
Warrant this work under normal environmental and use conditions against failure of materials, waterproofing and execution.

Warranty period: 5 years by the NURAPLY Applicator

From: Date of completion of the application

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

MATERIAL WARRANTY

NURAPLY applicator to provide a NURALITE Waterproofing LIMITED Materials Performance Warranty in the supplier's standard form.

Warranty period: 25 years (two layer systems)

From: Date of completion of the application

TEST

Flood test horizontal applications with a minimum 50 mm depth of water for 24 hours. Make good any lack of watertightness when the surface is completely dry.

PERFORMANCE

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

AS APPROVED

"As approved" means that the materials are compatible with NURAPLY 3P roofing and are part of the system required by the roofing supplier for each specific location.

PRODUCTS

NURALITE WATERPROOFING MEMBRANE

NURAPLY 3P single layer, 3 mm thick reinforced fibre asphalt waterproofing membrane. Sand surface for smooth NURACOLOUR dressing or for overlaying.

EDGE TRIM

To NURAPLY 3P system supplier's details and to suit the specific location. NURATRIM aluminium verge trim where detailed.

OUTLETS

As detailed and rebated into surfaces as required by NURALITE Waterproofing LIMITED.

VENTILATORS

NURAVENTS in plywood roofs to NURALITE Waterproofing LIMITED specification.
Round or square NURAVENTS as described in 4. SELECTIONS.

ACCESSORIES

Accessories as required including:
Adhesives: NURABOND No. 10
Primer: NURAFLUX
Sealants: Seal'n'Flex

COATING

Surface dressing: NURACOLOUR or NURACOAT

EXECUTION

GENERALLY

Work and materials to BRANZ Bulletins 345 and 346, and to NURALITE Waterproofing LIMITED installation instructions.

STORAGE

Take delivery of rolls undamaged and include for site handling facilities where required. Stack on end, off the ground on a level surface and with accessories. Store in shade or cover in hot sun. Protect liquid components from freezing.

LAYOUT

If not detailed on the drawings, confirm the layout to suit site conditions and for the performance of the NURAPLY 3P system. Stagger junctions of NURAPLY 3P rolls to avoid 4 layer membrane build-up at corner lap joints. Confirm the location and type of NURAVENTS.

PRELIMINARY WORK
Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, provision of battens and fillets and location of NURAVENTS and outlets rebated to levels, is complete and properly constructed to enable the system to work as intended. This work and the substrate to be smooth, clean and dry.

ACCEPTANCE OF SUBSTRATE
Confirm that the substrate, including fillets, sumps, rebated outlets and projections, will ensure NURAPLY work of the required standard. Ensure the substrate is smooth, clean and dry and falls on roofs are 1 in 50 minimum and gutters 1 in 100 minimum.

PLYWOOD SUBSTRATE
Ensure that sheets have been stack bond laid to falls, are rigid, with joints flush, edges arrised, upstands filleted, no lumps or hollows, smooth, clean, dry and free of debris. Plywood grain across the line of supports below.
MOISTURE ABSORBENT SUBSTRATE
Lay NURAPLY to cover the moisture absorbent dry-laid base on the same day the base is laid, or ensure that the base is kept covered and dry until NURAPLY is laid. Seal exposed NURAPLY edges at the end of each work period.

Application - NURAPLY 3P Two layer system

LAYING AND JOINTING
Lay NURAPLY 3P using NURABOND No. 10 cold applied under surface adhesive. Lay in order from sumps, through gutters, valleys, eaves, verges, main roof and upstands to cover flashings. Lap joints minimum 75 mm down edge of roll and 100 mm across the end of the roll, to NURALITE Waterproofing LIMITED requirements. Ensure unobstructed drainage flow at outlets.

WELD JOINTS
Heat fuse joints minimum width 75 mm side and 100 mm end laps, using NURALITE Waterproofing LIMITED self checking lap welding techniques.

PENETRATIONS
Form mould, weld and flash all upstands, downturns and penetrations to NURALITE Waterproofing LIMITED details, including raised, anti-ponding water deflectors on the upside of penetrations.

MOVEMENT JOINTS
Form and weatherproof movement joints as designed to NURALITE Waterproofing LIMITED details.

JUNCTIONS
Check that adjoining walls and parapets are prepared ready for the installation of NURAPLY roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof.

Required work includes the following:
- 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), up and over the top and walls and parapets, as detailed.

TOPPINGS/OVERLAYS
Ensure the specified NURACOLOUR or NURACOAT coating or topping system is placed within 5 days of completing laying. Clean NURAPLY 3P surface before application of NURACOLOUR, NURACOAT or overlays. Refer to 4. SELECTIONS for selection of toppings and overlays.

Completion

CLEAN UP
Clean up as the work proceeds.

LEAVE

Leave work to the standard required by following procedures as specified and to NURALITE Waterproofing LIMITED details.

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

SELECTIONS

TWO LAYER NURAPLY 3P SYSTEM ON PLYWOOD
Location: flat roof as shown on the drawings
Brand: NURALITE Waterproofing LIMITED
Type: NURALITE 3P
Ventilators: NURAVENTS
Number: One NURAVENT per 20 m

SECTION 9 - PLUMBING AND DRAINAGE

9.1 SCOPE

This section of plumbing relates to flashings, Gas services, Infloor heating, Hot water, water supply and drainage, and associated fittings and fixtures.

9.2 MATERIALS AND WORKMANSHIP

All plumbing and drainage work shall be done in strict accordance with the requirements of the NEW ZEALAND BUILDING CODE and other relevant adopted standards. Drains shall be laid by registered workmen only. The plumbing contractor shall obtain all necessary permits for the work, arrange all inspections and pay all fees as required. Materials shall be first grade and comply with current NZ standards.

Supply all fittings, materials etc. and do all work necessary to complete the installation shown whether specifically described herein or not. Conceal all pipe runs. Firmly secure all work with proper brackets, saddles etc. Test all pipes for leaks, eliminate water hammer and carry out pressure tests before linings are fixed.

9.3 AQUATHERM PIPED WATER SYSTEM

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

BUILDING CODE DURABILITY
Elements covered by this part of the specification, are expected to meet the following durability requirements of the NZBC clause B2 Durability.

50 years for aquatherm Fusiotherm®.
Refer to BRANZ Appraisal certificate 539 aquatherm Fusiotherm®.
SAI Global certificate SMK02437

BUILDING CODE COMPLIANCE
Work covered by this part of the specification is to be constructed to comply with the following NZBC clauses:

NZBC G12/AS1 Water supplies
SAI Global certificate SMK02437
BRANZ Appraisal certificate 539 aquatherm Fusiotherm®

DOCUMENTS REFERRED TO

Documents referred to in this section are:
NZBC G12/AS1 Water supplies
AS/NZS 3500.1 Plumbing and drainage - Water services
AS/NZS 3500.4 Plumbing and drainage - Heated water services
AS/NZS 3500.5 Plumbing and drainage - Domestic installations
NZS 4602 Low pressure copper thermal storage electric water heaters
NZS 4606 Storage water heaters
NZS 4607 Installation of thermal storage electric water heaters: valve vented Systems
NZS 4617 Tempering (3-port mixing) valves
NZS 5261 Installation of gas burning appliances and equipment
NZS 7602 Polyethylene pipe (Type 5) for cold water services
AS 3688 Water supply – Copper and copper alloy body compression and capillary fittings and threaded-end connectors
DIN 8077 Polypropylene (PP-R) Pipe dimensions
DIN 8078 Polypropylene (PP-R) pipes types 1, 2 & 3, General quality Requirements and testing.
BRANZ Appraisal 539 aquatherm Fusiotherm®
Plumbers, Gasfitters and Drainlayers Act 1976

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

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
Fusiotherm® Pipe systems technical manual – For the application in sanitary and heating

Copies of the above literature are available from aquatherm
Web: www.aquatherm.co.nz
Email: sales@aquatherm.co.nz
Telephone: 0-9-570 7204
Facsimile: 0-9-570 7206

NO SUBSTITUTIONS
Substitutions are not permitted to any specified aquatherm Fusiotherm® or associated products, components or accessories.

QUALIFICATIONS
Plumbers to be certified aquatherm Fusiotherm® installers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a plumber registered under the Plumbers, Gasfitters and Drainlayers Act 1976.

PIPEWORK LAYOUTS
Pipework in certain area will be exposed. Pipework shall horizontal run across underside of concrete ceilings, fixed firmly in place to be painted out with ceiling. Vertical runs shall be concealed with the timber framed walls.

INFORMATION FOR MAINTENANCE MANUAL
Supply maintenance manual information to the requirements set out in GENERAL section.

WARRANTY
Warrant this work under normal environmental and use conditions against failure of materials and execution.
Warranty period: 2 years

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

MATERIAL WARRANTY
Provide an aquatherm GmbH materials and installation warranty in the supplier's standard form including NZ$5,000,000 cover for third party legal liability.
Warranty period: 10 years
From: Date of completion of system testing

TESTING
Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Ensure that any connected tapware is isolated before commencing testing. Test to aquatherm Fusiotherm® testing procedures as applicable. Provide completed test records in the aquatherm New Zealand Products Catalogue standard form.

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

FUSIOTHERM POLYPROPYLENE PP-R 80 WATER PIPE
Fusiotherm® pipes to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched.

WATER METER
To the requirements of the network utility operator and building operator.

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

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

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

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
A grade to NZS 4606, part 3 ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

PIPE CLAMPS
Fusiotherm® proprietary pipe clamps and clips.

VALVES
Fusiotherm® proprietary valves and ball cocks as selected and required.

HANDLE AND STORE
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover, out of direct sunlight, on a clean level area, stacked to eliminate movement and away from work in progress to Fusiotherm® Pipe systems technical manual, section 4 Installation principles.

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

FASTENING TECHNIQUE
Fix pipework using Fusiotherm® proprietary pipe brackets, spacing to Fusiotherm® Pipe systems technical manual, section 4 Installation principles. Ensure brackets are set out as fixed or sliding points Fusiotherm® Pipe systems technical manual, section 4 Installation principles.

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

IN CONCRETE INSTALLATION
Install directly in concrete to Fusiotherm® pipe installation procedures.

IN GROUND INSTALLATION
Install to AS/NZS 3500.5, clause 2.13.3 Under concrete slabs.

THERMAL MOVEMENT
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations. Install pipework to Fusiotherm® Pipe systems technical manual, section 4 Installation principles.

PIPE SIZE
Flow rates to each outlet to be no less than those given in NZBC G12/AS1: Water supplies, table 3, Acceptable flow rates to sanitary fixtures, with pipe size as determined in table 4, Tempering valve and nominal pipe diameters and the Fusiotherm® Pipe systems technical manual.

JOINTING POLYETHYLENE PIPE
Seal ring compression joints and electrofusion to NZBC G12/AS1: Water supplies.

FUSIOTHERM POLYPROPYLENE PP-R 80 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, fusion weld joins and install to manufacturers specifications, all to NZBC G12/AS1: Water supplies. Conceal pipework and pressure test before the wall linings are fixed.

WATER SUPPLY CONNECTION

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1: Water supplies.

COLD WATER INSTALLATION
From connection point, size the runs and branches to deliver the acceptable flow rate to NZBC G12/AS1: Water supplies, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures. Lay out pipes in straight runs with support spacing to NZBC G12/AS1: Water supplies, table 7, Water supply pipework support spacing firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with bends to Fusiotherm® requirements, complete with necessary valves and fittings.

MAIN ISOLATING VALVE
Install a Fusiotherm® isolating ball cock in an accessible position at the point of entry to the building.

IN LINE FILTER
Install an in line filter immediately adjacent to the isolating valve in an accessible position to allow for easy cleaning.

HOT WATER CYLINDER INSTALLATION GENERALLY
Install hot water cylinders complete to the manufacturer's requirements and with seismic restraint as required to storage cylinders, to NZBC G12/AS1: Water supplies, 6.10, Water heater installation. Valve-vented systems to NZS 4607.

HOT WATER PIPEWORK
Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/AS1: Water supplies, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with bends to Fusiotherm® requirements, complete with all necessary valves and fittings.

INSULATION
Lag all pipes with insulation to the manufacturer's requirements. Refer to SELECTIONS for type.

INSTALL TEMPERING VALVE
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

INSTALLING TAPWARE
Install to manufacturer's requirements.

FLUSH OUT PIPEWORK
Flush out pipework. Remove all filters, clean and reassemble.

REPLACE
Replace damaged or marked elements.

LEAVE
Leave work to the standard required by following procedures.

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

FUSIOTHERM POLYPROPYLENE PP-R 80 SDR 11
Size: 25 mm outside diameter

FUSIOTHERM POLYPROPYLENE PP-R 80 PIPE WORK
Branch off take: Fusiotherm® SDR 7.4
Branch main: Fusiotherm® SDR ~
Main: Fusiotherm® SDR ~

INSULATION
Brand: proprieatry

INFINITY GAS HOT WATER HEATING SYSTEM, MAINS PRESSURE

Brand: Selected Rheem system. Liaise with owners for a system suitable and capable for their requirements.

9.4 WATER STORAGE TANKS

This section relates to the installation of domestic rainwater storage tanks.

AS/NZS 1260 PVC-U pipes and fittings for drain, waste and vent application
AS 2070 Plastic materials for food contact use
AS/NZS 2845.1 Water supply – Mechanical backflow prevention devices
AS/NZS 3000 Electrical installations
AS/NZS 3500.1 Plumbing and drainage – water services
AS/NZS 3500.3 Plumbing and drainage – stormwater drainage
AS/NZS 4020 Testing of products for use in contact with drinking water
AS/NZS 4130 Polyethylene (PE) pipes for pressure applications
AS/NZS 4766 Polyethylene storage tanks for water and chemicals
ATS 5200.026 Technical Specification for plumbing and drainage products – Cold water storage
NZBC G1 Personal Hygiene
NZBC G12/AS1 Water Supplies
HB 230 Rainwater Tank Design and Installation Handbook

HEALTH REQUIREMENTS

Refer to The Ministry of Health publication "Household water supplies: The selection, operation, and maintenance of individual household water supplies" for guidance.

QUALIFICATIONS

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

DESIGN AND INSTALLATION

To HB 230 Rainwater Tank Design and Installation Handbook, to AS/NZS 3500.3 and to NZBC G1 and G12.

TESTING OF PRODUCTS

Materials used in the manufacture of rainwater tanks to be tested to AS/NZS 4020.

RAINWATER STORAGE TANK

Above ground tank manufactured from polyethylene to AS/NZS 4766 and to AS 2070.
Tanks to be fitted with a secure fitting lid to provide internal access for cleaning or inspection.

TANK FITTINGS

Fittings kit supplied with the tank for complete installation.

UPVC PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to AS/NZS 1260.

POLYETHYLENE PIPES AND FITTINGS

High density polyethylene pipe and fittings to AS/NZS 4130.

WATER PUMP

Pump designed to pressurised water supply from tank into the building.

TANK VENT

Vent with insect proof stainless steel mesh fitted on top of the tank.

FIRST FLUSH WATER DIVERTER

Wall mounted or underground system specific to installation. To prevent the first flow of water from the roof entering the water storage tank.

FILTER SYSTEM

Inline cartridge filter housing fitted between the first flush diverter and the inlet, or a 955 micron filter tank screen system fitted within the tank.

TANK VACUUM SYSTEM
Designed to suck from the bottom of the tank when the tank is full to overflowing. System to include anti siphon device.

WATER TREATMENT (UV)
Combination filtration and UV disinfection system.

SEALS
Uniseals for pipe connections to the top of the tank.

TANK BASE BEDDING
Clean sand or concrete 100 to 150 mm thick.

CONCRETE
To NZS 3104: Prescribed mix 17.5 MPa: For in situ tank base and water pump pad.

SITE ACCESS
Transportation on site to the position of the tank is at the risk and responsibility of the contractor. Make provision for manoeuvring and unloading of tank

SITE EXCAVATION FOR ABOVE GROUND TANK
Select level site, free of sharp protrusions. Form solid pad with a bed of sand or concrete, screeded level to a minimum depth of 50 mm. Extend pad 500 mm pass base of tank. On a sloping site excavate fully into bank and provide 600 mm clearance from the tank to the base of the cut. Do not place tank on any fill, over in ground pipes, cables or underground structures.

ABOVE GROUND TANK INSTALLATION
Position tank on the prepared compacted level base.

LAYING AND JOINTING
Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid.

WATER PUMP INSTALLATION
Install pump on a solid base bolted down through base plate. Place weather tight housing over the pump and secure to base. Connect to water supply and power supply

WATER TREATMENT SYSTEM INSTALLATION
Install ultraviolet light radiation treatment unit between pump and house to manufacturer's specifications. Connect to power supply provided.

BACK FLOW PREVENTION DEVICES
Install to AS/NZS 2845.1, to AS/NZS 3500.1 and to NZBC G12/AS1.

FIRST FLUSH WATER DIVERTER
Install either adjacent to the tank or underground, first flush water diverter. Connect downpipes from the roof gutter to the first flush water diverter. Connect the first flush diverter to the top of the tank. Refer to manufacturer's installation details.

FILTER INSTALLATION
Install proprietary in-line filter before the inlet connection.

INLET CONNECTION
Install inlet pipe into top of tank at manufacturer's designated mounting area using a Uniseal type connection.

OUTLET CONNECTION
Install pipe to manufacturer's installation details. To the outlet connect a floating arm draw-off to deliver water from 100 mm below the surface. From the base connection run a flexible hose to the pump. Install ball valve in line between base connection and water pump. Support all pipework at outlet.

OVERFLOW PIPE
Install pipe to manufacturer's installation details and connect into stormwater system or directed away from base of tank into garden.

PIPE SEALS
Insert Uniseals in clean cut holes of the correct size. Insert Uniseal into hole with widespread facing the pipe to be inserted. Lubricate the pipe with detergent and push through the Uniseal. Use only on top of tank connections.

ELECTRICAL CONNECTION
Installation to AS/NZS 3000. Allow to connect up water pump and water treatment unit to the power supply as provided.

POST INSTALLATION TESTING
Test and commission the completed system to manufacturer's requirements and AS/NZS 3500.1.16 Testing and Commissioning. At the completion and testing of the water service, check all valves and other components to confirm their correct performance.

REPLACE
Replace damaged or marked elements.

LEAVE
Leave work to the standard required by following procedures.

CLEAN
Clean and flush out the whole installation. Remove silt and debris.

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

RAINWATER TANK

Manufacturer:	Bayleys
Tank material:	To owners final selection
Capacity:	3 x 25,000 litres
First flush water diverter:	to be fitted to all tanks
Filter:	In-line cartridge filter housing
Tank vacuum kit:	As per manufacturer recommendations
Water pump:	As per manufacturer recommendations
Water treatment system:	As per manufacturer recommendations

9.5 GAS SERVICES

DOCUMENTS REFERRED TO
Documents referred to in this section are:
NZBC G10/AS1 Piped services (Gas)
NZBC G11/AS1 Gas as an energy source
AS/NZS 4129 Fittings for polyethylene pipes for pressure applications
AS/NZS 4130 Polyethylene(PE) pipes for pressure applications - Dimensions for series 2 pipes – gas (nominal outside diameter series)
AS/NZS 4130 Polyethylene (PE) pipes for pressure applications - Dimensions for series 3 pipes – gas (nominal inside diameter series)
AS 4176 Polyethylene/aluminium and cross linked polyethylene/aluminium macrocomposite pipe systems for pressure applications
NZS 5258 Gas distribution
NZS 5261 Gas Installation
AS 5601 Gas Installations
Electricity Regulations 1997
Gas Regulations 1993
Plumbers, Gasfitters and Drainlayers Act 1976