RENOVATIONS & UPGRADING WORKS TO EXISTING TOILETS AT CAAF

AT OTTAWA RD, NAMAKA, NADI

Specifications

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1.0 PRELIMINARIES

1.1 DEFINITIONS

- A.b.s. shall mean 'as before specified'.
- 'F' after timber sizes shall mean full finished size.
- Mfr. shall mean manufacture or manufacturing as applicable.

1.2 TRADE NAMES / MANUFACTURERS & SUPPLIERS REFERENCES

Trade Names or Manufacturers references given throughout this specification, unless specifically stated in this schedule P.C. and Provisional Sums, is for the Contractors guidance only. If the Contractor so requires he may use alternative materials of equal quality and standard, with prior written approval by the Designer. Where necessary, the Contractor shall, at the time of applying to the Designer for approval of an equivalent alternative, submit samples and specification details of the suggested items.

Suppliers' references given, unless specifically stated as a Nominated Supplier is for the Contractors guidance only. He may obtain the specified materials from alternative suppliers.

It is the Contractors responsibility, prior to firm order, to ensure availability, delivery time, etc. of any materials including those included under this section.

1.3 MATERIALS AND WORKMANSHIP

All materials shall be new and shall be first - grade quality unless otherwise specified and when liable to damage the materials shall be properly handled, stacked and / or stored with adequate protection. No substitute materials shall be used on the works unless approved. The Contractor shall remove at his expense and time any substitute materials used without prior approval.

All labor and workmanship throughout shall be executed in a manner consistent with first-class building practice.

Generally, all materials and workmanship shall comply with relevant Specifications and Codes as given in this present specifications and drawings and with the relevant Rules and Regulations of the appropriate Local Authorities have jurisdiction over the particular items of work. In the event of conflict in the above requirements, the last named shall apply.

It is the Contractors responsibility to maintain quality control, and to protect all fixed and unfixed materials from the damage or disfiguration until completion and handling over the works.

1.4 SAMPLES

Where Specification calls for materials and / or items to be selected and / or approved by the Designer, the Contractor shall furnish all samples at least (14) fourteen days prior to the date of such selection approval required by the Contractor.

1.5 MATERIALS IN COMMON TO SEVERAL TRADES

Cement: shall be best Portland Cement. Lime: shall be best fresh burnt stone lime. Sand: shall be clean and sharp, free from vegetable and other impurities and when used with cement shall be well washed if so required or directed. Water: shall be potable (drinkable) clean and fresh free from salt and other impurities. Refer also to Clause 1.13.

1.6 SIGNBOARD – Not Applicable

Allow for the construction to detail of a suitably supported and braced signboard painted and sign written with the project title and names as per drawing. Contractor to allow $1,200 in their tender for the supply and installation of the project sign board.

1.7 DIMENSIONS

On all Contract and other drawings figured dimensions shall be read in preference to scaling from same. All dimensions as indicated on the drawings shall be checked on the site. Any discrepancies shall be referred to the Designer immediately after a decision. The Contractor is responsible for all correct setting out and dimensions on site and shall rectify all mistakes at his own cost and time.

1.8 SURVEY AND SETTING OUT

A copy of a plan showing boundaries, offsets and spot levels will be made available at the office of the Designer and at the office of the proprietor.

The Contractor shall after setting out the works, submit to the Designer a certificate obtained from a Licensed Surveyor certifying that the works have been laid in accordance with the drawings supplied by the Designer. The Contractor shall allow for and pay the Surveyor.

For the purpose of accuracy, the Contractor shall, at his own cost, throughout the erection of the Structural framework and other stages as required, retain an experienced and competent Licensed Surveyor, whose duties shall be to establish and check the accuracy in both vertical and horizontal directions, of all basic structural works and set-outs and who shall verify all boundaries.

The results of such surveys shall be made available to the Designer immediately upon request by the Designer to the Contractor.

1.9 HURRICANE

The whole of this project shall be protected from Hurricane Force Winds. The Contractor shall inform the Designer / Engineer of any inadequate detailing against Hurricane Force Winds. The works including fixing for roofing materials, the strength of external door and window framing materials and thickness of external glazing and glass, etc. shall conform to design data as follows:- They must withstand: 60 metres per second (241 k.p.h.) wind speed for 3 seconds duration, cyclonic factor 1.15 Terrain Category 1.

1.10 PLANT AND EQUIPMENT

The Contractor shall give all notices of intention to erect plant which is controlled by any Act or Authority and pay all charges therewith.

The Contractor shall allow for the supply, delivery, assembly and erection, operation, maintaining and removal at completion of all construction plant and equipment necessary to execute the works efficiently. Such plant and equipment shall be of an efficient and recognized type and approved of where necessary by the relevant Inspector.

1.11 SITE OFFICE

Provide a Site Office for use of Foreman and Designer or Clerk of Works - 3600 x 2400mm and internally 2250 high and of standard construction, line walls with 19 thick waterproof ply with 50 x 12 cover strips. Line walls and ceiling / internally with 6 thick primer coated Masonite. Provide solid core W.P. door and lockset.

Provide each wall with one timber window 1800 x 800 wide with opening sashes.

Provided with one sloping bench 3600 x 700, 975 above floor level. Provide on 1200 x 900 table with sufficient chairs and stools. Provide Contractors site office and other staff amenities as required.

For Site Meetings, this office must be large enough to accommodate the representatives of the Client, Designer, Quantity Surveyor, Structural Engineer, Services Engineer, Contractor, Subcontractors and Suppliers.

1.12 TEMPORARY STRUCTURES AND AMENITIES

The Contractor shall allow for the supply and delivery, erection, maintenance and removal at completion of all temporary structures and amenities as required by the Awards for the use of all men employed on the Works, including those employed by the Sub-Contractors and shall maintain the same in a clean and sanitary conditions, all subject to the approval of the Authorities concerned.

1.13 TEMPORARY SERVICES

Water: The Contractor shall make all necessary arrangements for temporary water services, provide same to Authority requirements, pay all fees and charges incurred and remove same and make good at completion. If the supply is taken from a meter service the Contractor shall provide and fix a sub-meter and pay for all water used during the currency of the Contract.

Electricity: The Contractor shall provide a temporary electrical power supply for use on the works including for nominated sub-contractors and shall pay all electricity consumed and remove all equipment on completion.

Telephone: The Contractor shall arrange for the installation of a temporary telephone service and shall pay all charges, rental calls and shall make the telephone available to all persons concerned with the execution of the Contract.

1.14 TEMPORARY PROJECTION AND HOARDING

The Contractor shall be responsible for the maintenance of any existing protection works and for the provision and maintenance of proper temporary protection to finish work including guard rails, fencing, footways, barricades, hoardings, strutting and supporting of all comprised in this Contract as required by all Regulations, Ordinances, By-Laws, etc. and as far as same may be rendered necessary for all the protection of the Owners, Occupiers, Public and Property.

The Contractor shall be responsible for all damage, injury or loss sustained including all costs to make good or replace arising out of his failure or neglect to provide adequate temporary protection.

Special care to be taken to safeguard all existing trees to remain by adequate hoarding and fencing throughout the duration of Works. No cutting of existing trees to remain is permitted except with prior written consent from the Designer. Unauthorized damage or cutting of trees would incur a penalty of $10,000 per tree.

1.15 NIGHT LIGHTING

The Contractor shall be responsible for the provision of proper lighting to barricades, materials, etc. that maybe stacked in any public place and all temporary lighting that may be required for the night work. No portable naked lights shall be used for any work executed inside the premises.

1.16 EXPLOSIVE POWERED TOOLS

The use of explosive powered tools shall be governed strictly by the regulations and directions of Authorities having jurisdiction over same and the Contractor shall be strictly responsible for and shall settle at his own expense any claim for damage or injury resulting.

1.17 SITE MEETINGS

The Contractor's senior representative and the Designer's representative shall be responsible on the site at agreed Intervals to discuss progress and shall arrange for the attendance of Consultants and Sub-Consultants and of such other members of their staffs and representatives of Sub-Contractors and Suppliers as may be required.

The Designer's representative shall chair such meetings and shall prepare records of the proceedings and shall provide copies to Project Team.

Matters discussed & confirmed at Site Meetings shall be deem to become Designers Instructions.

1.18 DESIGNERS REASONABLE SATISFACTION

No expression of the Designer's reasonable satisfaction or approval shall be deemed to be an acceptance of the defective materials or workmanship not complying with the terms of this Contract nor as Authority for any variation except where such variation is authorized as provided in this contract in writing by the Designer.

1.19 SPECIAL INSPECTIONS BY ENGINEERS

Contractor to allow, $600 per visit for special visits by engineers for inspections of critical structural components. Allow for 5 visits for the duration of the contract.

1.19.1 DELAYS

1.19.2 DELAYS BY INCLEMENT WEATHER AND CRITICAL PATH

a) Only those elements indicated on the Critical Path of the programme of the work as being able to be affected by inclement weather will be considered when claims for extension of time are presented.

b) The claim must be backed by a certificate from the Meteorological Office indicating continuous moderate to rainfall.

c) Only delays occurring in the work week from Monday to Friday and during normal working hours will be considered.

d) The claim must be supported by the Clerk of Works weekly reports; if one is appointed.

e) Extensions of Time to the contract period for wet weather will be allowed only for working days on which there is 4 or more hours of continuous rain which effects the progress of the works. Extensions of time due to wet weather as herein specified must be applied for within 7 days stating parts of the work effected and man hours lost.

1.19.3 Delays due to non-availability / delivery of materials will be considered only if procedures outlined in Clause 20 have been adhered to.

1.20 ORDERING MATERIALS

1.20.1 The Contractor must order all materials - local and imported - within one month of commencement of Contract; and inform the manufacturers / suppliers of specific date when material is required on site, at the time of order. All materials affecting the Critical Path of the Programme must be ordered within one week of commencement of Contract.

1.20.2 When ordering materials, the Contractor must provide a copy of the relevant specification clauses or other part of the documents to the manufacturer / supplier. When taking delivery, the Contractor must again ensure that the goods supplied are in accordance with the specification requirements.

1.20.3 Enquire from manufacturers and suppliers whether they provide guarantees / warranties for their materials and goods. Order from those who provide guarantees / warranties.

1.21 GUARANTEES / WARRANTIES

The Contractor shall provide the guarantees as specified under the various trades except where this is not reasonably possible and where the Contractor has so notified the Designer in writing before the work proceeds or the item ordered.

As soon as reasonably possible after Practical Completion, procure all Guarantees / Warranties as called for in the Schedule of Guarantees and Warranties in the name of the proprietor.

1.22 CLEANING UP ON COMPLETION

The Contractor shall, throughout the duration of the Contract, maintain the Works in an orderly, clean and tidy manner. Materials shall be stacked and handled in an orderly manner to facilitate inspection and checking. The site and works shall be cleaned and maintained in a tidy manner at all time.

Upon the satisfactory completion of the Contract, the Contractor shall remove all temporary works that he have been constructed for his own convenience while carrying out the Works, including the signboard and all equipment and surplus materials and any remaining rubbish, which may have accumulated.

The Contractor shall also clean all glass, tiles, fittings, floor and ease of windows, doors and the like, the oil locks and other movable metalwork, label and hand over keys and generally leave the premises clean and fit for occupation.

1.23 AS-BUILT DRAWINGS

The Contractor shall keep 'as-built' drawings as the work proceeds, giving exact dimensioned locations and inverts of all pipes, drains, service ducts, cables, etc. in and around the Works as well as deviations and offsets, etc. in dimensions vertically and horizontally and all other relevant matters.

At completion, the Contractor shall produce, at his own cost, 4 sets of AS-BUILT DRAWINGS and deliver to Designers.

Also, the Contractor, as the work proceeds, shall supervise the 'As-Built' drawings being prepared by the Sub-Contractors for Services and all other relevant matters pertaining to the works.
Refer to Schedule of As-Built Drawings and Manuals.

1.24 DEMOLITION AND SURPLUS MATERIALS

All surplus materials removed from demolition and excavation work shall be removed from the property of the Owner, unless otherwise stated on the drawings. The contractor is responsible for providing top soil to all planter boxes and lawn areas.

2.0 EXCAVATIONS

2.1 EXTENT OF WORK

The works specified in this part comprises: Excavations for footing pads and beam footings; floor slabs and pavings, all service pipes, drains, pits etc. as indicated in drawings.

2.2 SETTING OUT

The setting out of the work shall be carried out by a registered surveyor in accordance with the Designerural and civil drawings.

The surveyor's certificates indicating the correct set out both horizontally and vertically shall be presented to the Project Manager for approval before further work is carried out.

The setting out of the work must be approved by the Project Manager on site.

2.3 CLEARING THE SITE

Clear the whole site affected by building and earthworks, paving and areas to be excavated or filled. Strip off all bushes and other growth; grub out all stumps and roots; strip off all rubbish, debris, grass and other vegetable matter. Remove the whole from the site and legally dispose. All materials shall be loaded on site to prevent spillage.

2.4 TRAFFIC FACILITIES

Provision for the safe and convenient passage through or around the work shall be made by the contractor; suitable barriers and erection of warning sign to regulate and protect traffic shall be provided, and maintained as necessary and as directed by the Project Manager.

2.5 EXCAVATIONS GENERALLY

Suspend all earthworks if directed or when unsatisfactory work would result, due to inclement weather, saturation of materials by seepage flows, or other condition. Recommence when materials are no longer affected.

Keep works free of water and protect by construction of necessary open drains. Maintain until no longer required.

Provide working space in excavation as required. If timbering is not used, batter excavations at angle of repose of subject materials.

Form external banks to grades as shown on drawings. At transitions to adjacent surfaces grade to minimum one metre radius.

Approval of all excavations to be obtained prior to further work.

Obtain written instructions before excavating below contract depth and levels.

All additional excavations shall be at Bill or Schedule rates.

2.6 DISTURBED GROUND

The Contractor shall make good to all ground disturbed as a result of construction works, outside the bounds to ensure that natural levels are maintained and finished to match surrounding areas.

2.7 TIMBERING FOR EXCAVATIONS

Work to proceed in a careful safe way, with all due precautions being taken against accidents.

Contractor to erect shoring, metal casing, timbering etc, of sufficient strength and quality to prevent materials slipping or falling or being shaken from the side of the excavations. If in the opinion of the Engineer, sufficient or proper support has not been provided at any point, he may order additional support to be supplied and fixed at the Contractor's expense. Such action of the Engineer will not release the Contractor of any responsibility for the sufficiency of these, or any other supports. Care must be taken to prevent voids forming outside the sheeting. Should voids occur, they shall be back filled with consolidated materials to the Engineers satisfaction.

No excavation by machine is allowed within 1.0m of any existing underground services without prior approval of the Project Manager.

All shoring and timber to be struck and withdrawn as the work proceeds, except where unrecoverable metal casings are used and where written direction of the Engineer is received to the contrary.

2.8 FOUNDATION INSPECTION

When excavation for the footings has been completed to the required bearing specified on the drawings, the Contractor shall notify and provide assistance to allow the Engineer to inspect each hole and trench.

2.9 BACK FILLING

No backfilling around footings or under slabs to be done without prior approval of the Engineer. Back fill shall not exceed 150 mm thick layers, each solidly compacted to a minimum 100% of maximum dry density. Backfilling to be continuous under all haunchings, set downs and the like. Make due allowance for thickness of fill of a tolerance of 0mm - 12mm.

2.10 PREPARATION OF SUB-GRADE FOR FLOOR SLABS

Prepare the sub-grade under concrete floor slabs to the required levels to suit finished floor levels to a tolerance of 0mm - 12mm. Preparation to be continuous under all haunchings, set downs and the like.

2.11 PERCENTAGE PASSING STANDARD SIEVES and SAND BLINDING

25mm sieve: 100%; 19mm sieve: 95-100% sieve: 65-85%: 4.7mm sieve: 10-15%; NO.7 sieve: 0-15%.

Over the base courses, lay a blinding of clean sand, hosed in and finished to a nett thickness of generally 50 mm.

2.12 FOUNDATION PIERS

The depths for foundation priers shown on the drawings are for tendering purposes only and the work actually done will be measured on completion, and priced at bill rates or schedule rates.

Clean out pier holes and remove all loose materials and consolidate bottoms to approval of the Engineer.

2.13 LEVELS AROUND BUILDINGS

On completion of building operations proper, the Contractor shall distribute 200mm thickness of top soil as directed by the Project Manager.

This top soil shall be finished smoothly, shall be free of all rubbish and debris and shall be left in a fit state for immediate grass sowing and planting by the Landscaper or Owner.

2.14 DEFICIENT MATERIAL

If fill material is deficient, the Contractor shall import soapstone, river gravel and/or crushed metal fully compacted in layers as previously described all to the approval of the Engineer.

2.15 SURPLUS MATERIAL

All surplus excavated material shall remain the property of the Owner.

Stockpile surplus topsoil separately from soapstone etc. to area Works as directed by Owner or Project Manager on site.

2.16 WATERPROOFING

Under concrete floors and slabs lay a continuous membrane of polythene vapour barrier (min. 0.8mm thick) lapped 150mm at joints and turned up full depth at edges. Seal joints and any projections through polythene with recommended pressure sensitive tape all to the approval of the Designer.

In addition the outer vertical surfaces of concrete foundations and concrete block walls below natural ground level shall be waterproofed with an approved bituminous sealer, or equal applied to manufacturers recommendation all to the approval of the Designer.

Note: All concrete slabs and shallow foundations shall be set on the polythene vapour barrier which shall be set on 25mm minimum sand blinding on 75mm minimum compacted hard-fill.

3.0 CONCRETE

3.1 GENERAL

Materials and workmanship shall confirm to the relevant NZS Codes or equivalent Codes approved by the Engineer.

Refer to NOTES on Structural Drawings.

3.2 MATERIALS

CEMENT: Shall be standard Portland cement manufacture delivered to the site in sealed bags as provided by the manufacturer. No cement showing signs of lumping shall be used; no re-bagged cement shall be delivered to the site. Cement shall be stored off the ground in a clean, dry, weatherproof construction specifically constructed for and exclusively used for this purpose. Cement shall be used as nearly as practicable in the order in which it is delivered to the site.

SAND: Shall be clean coarse grained sand, free from mud, salt and deleterious or carbonaceous matter and where requested by the Engineer shall be washed in fresh water. Sources of sand shall be inspected and approved by the Engineer before transportation to the site and sands shall be mixed if so required by the Engineer to obtain acceptable gradings.

COARSE AGGREGATE: Shall be sieved to specified grades and stock - piled separately with samples of each grade taken from time to time by the Engineer and the mix tested to suit quality and grading of these aggregates.

(a) passing 38mm sieve and retained on 19mm sieve.
(b) passing 19mm sieve and retained on 6mm sieve.
(c) passing 6 mm sieve and retained on No. 14 sieve.

WATER: Shall be potable (drinkable), clean and fresh, free from salt and other impurities.

REINFORCEMENT: Shall be round mild steel bars complying with AS1302 or the equivalent BSS, clean and free from dirt, grease, paint or other foreign matter. Remove all loose scale before concrete is poured. Rods shall be cold bent to the correct shapes with all hooks as shown. Wire mesh reinforcement consisting of steel fabric composed of wires or bars welded into a mesh shape constructed from steel which before welding shall comply with the requirements of British Standard specifications or equivalent to Australian Standard and shall be supplied in flat sheets. All bars over 12 dia. shall be deformed complying with the BSS code for deformed bars. Unless otherwise shown or specified, the minimum clear cover to main reinforcement shall be as follows:-

- where concrete is in contact with ground - 75 mm
- under-sides of beams and all columns - 40 mm
- sides of beams - 25 mm
- floor slabs - 20 mm

Secure alternate passings with 16 gauge black blinding wire to prevent movement while concreting. Splices of reinforcement shall be made only at the points shown on drawings except with the approval of the Engineer.

Lapping reinforcement shall be of such a length as to develop the full strength of the bars. In splices the length bars shall be placed at the minimum distance apart of 1 1/2 times the maximum size of the coarse aggregate. Fabric reinforcement shall be lapped to develop the full strength of the bars in both directions.

3.3 MIXING

GENERAL: Concrete shall be mixed only in the quantities required for immediate use. The use of partly hardened concrete or remixing of such concrete without additional cement, aggregate or water, will not be permitted.

MACHINE MIXING: Concrete shall be mixed in batch mixers of an approved type or types which will ensure uniform distribution of the ingredients throughout the mass. During mixing, the drum shall rotated at the optimum speed recommended by the manufacturer or, where no such recommendation has been made, at the speed of not less that fourteen (14) or more than twenty (20) revolutions per minute.

The mixers shall be in good operating condition and the interior of the drums and the mixing blades shall be kept thoroughly clean and free of hardened concrete or mortar. Mixing shall be continued for a minimum of one and a half (1 1/2) minutes after all the ingredients are in the mixer before any portion of the batch is discharged.

HAND MIXER: Mixing by hand shall not be permitted except in an emergency and then only subject to the approval of the Engineer.

PRE-MIXING: Concrete which has been mixed in an approved central plant and transported to the site in a pre-mixed condition by means of specially constructed conveyance or transit mixers will be accepted, provided that it complies in all respects with the requirements of this specification and AS1379 "Ready Mixed Concrete" or the equivalent British Standard Specification.

The Contractor must notify the Engineer 24 hours in advance of his intention to use ready-mixed concrete to enable arrangements to be made for the Engineer or his representative to be present at the Plant and/or the site during placing.

The concrete shall be discharged at the site within 1 1/4 hours after the cement and water have been added to the mix in the factory and shall be placed in position within fifteen (15) minutes after discharges.

3.4 TESTS

3.4.1 COMPRESSION TEST: The Contractor shall allow the taking of three concrete test cylinders, either (304.8 x 152.4) per concrete pour, or, as many other as may be directed by the Engineer. These cylinders shall be taken form any random delivery of concrete for the test or as directed by the Engineer and shall be cured on site in conditions as near as possible to those under which the pour were taken when being cured. The cylinders shall be prepared from a representative sample of the delivery.

3.4.2 CONCRETE STRENGTHS: Unless otherwise stated, the characteristic strength of the concrete shall be as follows:

25 Mpa generally

All concrete shall be ready mix unless otherwise approved.

3.5 CONSISTENCY

Slump tests, in accordance with AS1012 part 3 or relevant British Standard Specification shall be made by the Contractor at least once a day at the commencement of work and at such other times as the Engineer may require. The Contractor shall provide all materials, labour and facilities required for this purpose, including the necessary standard mould. The consistency of the concrete shall be such as to produce slump, under test, within the following ranges:

(a)	Footings, retaining and other walls	-	50 to 75 mm
(b)	Floor slabs - suspended and on ground	-	25 to 75 mm
(c)	Beams and columns	-	50 to 75 mm

3.6 TEST BELOW SPECIFIED STRENGTH

Where the compressive strengths of works control tests fall below the values specified under Clause D04, the Engineer will order replacement or strengthening of the portions of the structure which fail to develop the required strength, and all such strengthening or replacement shall be carried out by the Contractor at his own expense.

3.7 PLACING

All concrete shall be finally placed in position within 30 minutes of leaving the mixer. It shall be well rodded around the steel, and into the corners of the formwork. The re-tempering of concrete which has hardened will not be permitted. No concrete shall be placed under unfavourable weather conditions. Concrete shall have a minimum handling between the mixer and the final position and shall not be allowed to drop freely more than 1800 mm. Placing shall be in uniform layers, well vibrated by approved mechanical/electrical vibrator to consolidate concrete without segregation.

Concrete shall be placed in daylight or under such lighting conditions as may be approved by the Engineer.

No concrete shall be placed until reinforcement and formwork have been inspected and approved by the Engineer. Twenty -four hours notice shall be given to the Engineer of the intention to place concrete.

Prior to placing of concrete, the surfaces of all appliances to be used for this work shall be thoroughly cleaned of all hardened concrete or foreign matter. Formwork shall be cleaned of debris and free water.

Concrete shall not be deposited in wet trenches or in running water.

Concrete shall be conveyed from the mixers to the place of final deposit without delay and by methods which will not cause or permit segregation and/or loss of materials. It shall be transported on substantial gangways supported above the reinforcements by trestles resting on the formwork.

Each monolithic portion of the work shall, except where the use of construction joints is approved, be placed in one continuous operation. The order of placing shall be as required by the Engineer and shall be so arranged that new concrete is continually being placed against unset concrete so that a monolithic structure will result.

No concrete which has partially hardened or has been contaminated by foreign materials shall be deposited in the work. Re - tempered concrete shall not be used.

Concrete shall not be placed at a rate greater than that which will permit satisfactory compaction or to a depth greater than 450 mm before compaction thereof. The Contractor shall, at all times during which concrete is being placed, provide adequate labour to ensure that the concrete is compacted in the forms to the satisfaction of the Engineer.

If ready-mixed concrete is used, the Contractor must organise the delivery of concrete to the site in such quantities as can be efficiently handled by the labour available.

All vertical members including walls, shall be placed and compacted at least twelve (12) hours before any horizontal members (including reinforcement) which they support, are placed.

3.8 COMPACTION BY HAND

Where mechanical vibration cannot be used, as determined by the Engineer. The concrete shall be thoroughly compacted by means of continuous stamping, spading and slicing during and immediately after placing. Care shall be taken to fill every part of the forms, to work the concrete under and around the reinforcement without displacing it, to work coarse aggregate back from the form faces and to remove all air bubbles and voids.

3.9 COMPACTION BY MECHANICAL VIBRATION

Mechanical vibration shall be used throughout for compacting the concrete.

Vibrators shall be of an approved type transmitting not less than 9,000 impulses per minute when under load.

Vibrators shall be operated to the satisfaction of the Engineers. They shall be uniformly spaced and not further apart from 600 mm of the radius beyond which vibration is visibly effective. They shall be provided in sufficient number to ensure compaction at a rate satisfactory to the Engineers. In addition, at least one vibrator of each type shall be kept in reserve for emergency use. Vibrators shall be moved continuously throughout the wet concrete and shall not be allowed to remain in any one position for more than 10 seconds.

At least two vibrators shall be available at the commencement of work.

Vibration should achieve uniform density of the concrete but should not be continued to the extent that localised areas of void or grout are formed.

Particular care shall be exercised to avoid damage to partially set concrete.

3.10 POOR COMPACTION

If in the opinion of the Engineer the concrete when exposed by stripping the forms, is incompletely compacted, the Contractor shall immediately hack back, removing all laitance and make good the honeycombed areas with a 3:1 sand and cement mortar while the concrete is still green. The Contractor shall reconstruct at his own expense any structural members or portions of the work which are shown to be fully, either by tests or inspection.

3.11 CONSTRUCTION JOINTS

The location of construction joints shall be planned in advance and shall be approved by the Engineer prior to commencement of concreting.

3.12 PROTECTION

Freshly cast concrete shall be protected from premature drying and excessively hot or cold temperatures. In windy condition, windbreaks shall be erected to shield the concrete surface during and after placing. The concrete shall be maintained at a reasonably constant temperature with minimum moisture loss for the curing priod.

The responsibility for the curing and protection of the concrete shall rest entirely with the Contractor. Curing methods which do not conform to this specification shall be rejected.

3.13 CURING

All exposed surfaces of concrete shall be cured by one of the following methods:

(i) Ponding or continuous sprinkling with water.
(ii) Covering with an impermeable membrane concrete that has taken its initial set and that has been moistened with a fine spray of water. The covering material shall be held firmly against the concrete for the full length of all edges and laps and at frequent intervals between, so that there shall be no air circulation at the concrete surface.

(iii) The use of an absorptive cover, kept continuously wet. The use of curing compounds confirming to ASTM C309 are not permissible except with the Engineer's Approval in writing.

3.14 CURING PERIOD

Curing shall commence immediately after initial set of concrete and shall continue for 7 days.

3.15 DAMAGE

The concrete shall be protected from damage due to over - stresses, heavy shocks and excessive vibration, particularly during the curing period.

All finished concrete surface shall be protected from damage due to any cause as construction activities, rain and running water. Self - supporting structures shall not be loaded in any way which will overstress the concrete.

3.16 TOLERANCES

(a) sides of members and thickness of slabs: + 6mm, -0mm.
(b) surfaces: + 3mm, -3mm to 3mm long straight edge.
(c) surface deviation: + 1.5mm in 300mm.
(d) abutting surfaces at joint: + 1.5mm, -1.5mm.

3.17 BUILDING - IN

Allow for all Sub-contractor's work. Build-in all metal work etc.

Form all openings, set-downs etc. Keep all exposed bolt threads clean.

Build in all under floor pipeworks, leave sleeve for drains, pipes etc as necessary. Also refer Designerural and Hydraulic Drawings.

3.18 SCREED

Screed strength shall be 20 MPa.

3.19 FORMWORK

Formwork shall conform with NZS Codes AS1082, AS1509 and AS1510 or equivalent BSS. The responsibility for the sufficiency of the whole formwork shall rest entirely with the Contractor. Formwork shall be constructed from sound material properly supported and braced or tied to maintain position and shape during and after the placing of concrete. Formwork shall be supported in a manner which will prevent its settlement. Formwork shall be kept in place for 3 days at column and beam sides and 14 days for soffits generally and to the Engineer's Approval and in accordance with NZS Codes AS1082, AS1509 and AS1510 or equivalent BSS.

3.20 CONCRETE PAVING TO RECEIVE SPECIAL FINISH

All exterior concrete paving surfaces to receive special finish of applied aggregate by Nominated Applicator must comply with the following requirements:

- Surfaces must be rough - broomed with brittle broom and must be free of all latence to form key and bond with applied finish.
- All surfaces must be roughened to the satisfaction of the Special Finish Applicator.
- All surfaces not accepted by the Special Finish Applicator must be fixed at the Contractor's own expense.

3.21 CONCRETE DRIVEWAY AND RAMP

Concrete driveway and ramp surfaces shall have a monolithic (no plaster) V broomed (with a stiff broom) at right angles to the direction of travel finish.

4.0 BLOCKS

4.1 EXTENT

The work under this section comprises the provision of all labor, materials and equipment necessary to carry out and complete all concrete block masonry. Relevant clauses under 'Concrete Work' shall apply.

Refer to NOTES on Structural Drawings.

4.2 STANDARDS

New Zealand Standards, N.Z.S.S. 595, N.Z.S.S 1990 or A.S. 1475 part 2 shall apply in respect of materials, component and construction.

Samples of each batch of purchased blocks must be submitted to the Principal Consultant and the Engineer for approval.

4.3 MATERIALS

4.3.1 BLOCKS

Blocks shall be nominally solid or hollow blocks with corresponding half, three-quarter, and specials manufactured in an approved machine and steam cured to obtain a minimum crushing strength on the net area of 12 MPa. All blocks used shall have clean sharp arises and to be true to shape and natural grey in colour.

The blocks shall conform to approved samples and shall comply with the requirements of the current standards for concrete masonry.

Modular units of nominal 100mm, 150mm and 200mm thicknesses shall be used on locations indicated in drawings.

4.3.2 MORTAR

Mortar shall be freshly prepared and uniformly mixed in the ratio of 1 cement to 3 sand. Lime may be added up to a maximum of 1/2 part to 1 cement and 3 1/2 parts sand. Mortar is to be accurately gauged in block and no mortar is to be used after it has taken its initial set. Mortar board and mixing platforms are to be cleaned each night and surplus mortar is **NOT** to be used.

4.3.3 GROUT

Grout shall be of fluid consistency and mixed in the ratio 3 part cement to 8 parts of sand and 4 parts coarse aggregate (13.2 - 4.75mm) unless noted otherwise.

4.3.4 ADMIXTURES

No admixtures shall be used in mortar or grout unless specifically approved by the Engineer.

4.3.5 REINFORCING STEEL

In unreinforced block work approved 8 gauge galvanized ladder-mesh to suit wall thickness shall be laid in every 3rd horizontal joint and above and below all openings. Lap mesh 300mm at joints and intersections.

In reinforced block walls, reinforced shall be as specified for Concrete Work.

Reinforcing bars shall be straight expect for bends around corners or where bends or hooks are detailed on the plan. Bars shall be lapped 40 dia. minimum where spliced or joined. Vertical bars shall be held in position at the top and at intervals not exceeding 192 dia. of the bars.

When a foundation dowel does not line up with the vertical core to be reinforced it shall not be bent over but shall be grouted into a core in direct vertical alignment even though it is in an adjacent cell to the vertical wall reinforcing.

4.3.6 PLASTER

1 part cement to 3 parts washed and screened sand mixed thoroughly with water to give an even and easily workable consistency.

4.4 LAYING

Concrete blocks shall be laid plumb and square by skilled tradesmen in a workmen like manner. Blocks shall be laid dry and shall therefore be suitably stacked under cover on site and on timber pallets to avoid contact with the ground. Special types of blockwork units shall be used where applicable and shown on drawings. For exposed work, particular care shall be taken to provide a clean neat surface.

Generally, block work shall be laid out in stretching bond or stackbond where shown, in cement mortar as described above. Proper special units shall be used to provide for all windows, doors, bond beams, etc., with minimum of unit cutting. Where block cutting is necessary, all cuts shall be neat and regular. No broken blocks shall be used expect where legitimately for bonding.

Where no bond is specified, the walls shall be laid up in straight uniform course with regular stretching bond. Intersection block walls and partitions shall be bonded by use of steel ties at maximum 600mm centres.

4.5 TIE BEAMS

Tie beams of reinforced concrete shall be placed in all block walls at roof level and at such intermediate levels as may be required to limit the vertical height of block work to 4800mm. Such tie beams to be of minimum dimensions 300 x 200 wide with not less than four 16 dia bars placed two at the top and two at the bottom with 6 dia tie at 150 centres maximum.

The Tie Beam shall be continuous. Continuity of the reinforcing in straight runs shall be provided by lapping splices not less than 640. Continuity shall be provided at corners by bending two 16 bars from each direction around the corner a minimum of 450. Continuity at columns shall be provided by continuing horizontal reinforcing through columns or by bending horizontal reinforcing down or up into the columns a minimum distance of 300.

A Tie Beam shall not be required where floor or roof systems provide a rigid diaphragm of reinforced concrete.

Changes in level of tie beams shall be at columns. The concrete in tie beams shall be placed to bond the blocks immediately below and shall not be separated there from by wood, felt or any other material which may prevent bond.

4.6 REINFORCED BLOCK WALL

Where block walls are described as reinforced, blocks shall be selected to provide the unobstructed vertical continuity of the cells to be filled. Such vertical cells to be filled shall have vertical alignment to maintain a continuos unobstructed cell area of less than 75 x 50.

A clean out hole shall be provided at the bottom of each cell poured when the height of grout pour exceeds 1200. All debris and projecting mortar shall be cleaned out before pouring grout. Reinforcing steel shall be in place and inspected before grouting commences. Cells containing reinforcement shall be solidly filled with grout in lifts not exceeding 1200mm and pours shall be stopped 40 below the top of a course to form a key at pour joints.

4.7 CAUSES, RECESSES & OPENINGS

No chase or recess in any blockwall shall be deeper than 1/2 of the wall thickness. No horizontal chase or horizontal projection of the diagonal chase shall exceed 1200mm. No required tie column or tie beam shall be reduced in required dimension by chasing or recessing. No recess in required thickness of a block wall shall exceed over-all dimensions of 900 x 600.

4.8 BUILD IN

Build in all M.S. Members, straps, bolts, etc. and other fixtures required by other trades. Build in all flashings as required including cavity flashings, window flashings, parapet flashings etc. Build in all door frames and window frames as shown. Form holes, openings, chases and recesses as shown and as required by other trades but not exceeding limits specified above without the express consent of the Engineer.

Build in all grounds as necessary.

4.9 CONTROL JOINTS

Shrinkage control joints shall be constructed where directed or at maximum 13500mm intervals.

4.10 PROTECTION OF WORK

On completion of day's work cover last two courses of block work with draped visqueen membrane or similar to protect from damage by elements.

4.11 BLOCK WORK TO RECEIVE SPECIAL FINISH (not applicable)

An exterior and interior concrete blockwork to receive special finish of applied aggregate by Nominated Applicator must comply with the following requirements:-

- Blocks to be selected true, plumb and square.
- Blockwork to be flush jointed.
- See also Clause D21 for Concrete.

The Nominated Applicator shall be responsible for surface preparation before application of special finish.

5.0 STEEL AND METAL

5.1 GENERAL

This section describes besides particular metalwork to a trade, all metalwork specified in conjunction with other items in other trades in all metalwork required to construct and complete the work.

Refer to NOTES on Structural Drawings.

5.2 MATERIALS

The Quality of all materials used in the execution of this contract shall comply with the requirements of the following Standard Specifications:-

a) STRUCTURAL STEEL
AS1032 or the equivalent B.S.S.

b) STEEL PLATES
AS1204 or the equivalent B.S.S.

c) ELECTRODES
AS1554 or the equivalent B.S.S.

d) BLACK BOLTS, NUTS AND WASHERS
AS1511 and AS1252 or the equivalent B.S.S.

e) DESIGN, FABRICATION AND ERECTION
AS1250 - 1975 or the equivalent B.S.S.

f) METALLIC ARC WELDING
AS1554 or the equivalent B.S.S.

g) TUBULAR WORK
Involving galvanised steel tubing (known as G.W.I. pipes) the size is the nominal internal diameter (I.D.) of the pipe of water service strength, and stainless steel tubing.

h) ALUMINIUM AND STAINLESS STEEL
To conform to the S.A.A. Specification of gauges and thicknesses indicated and suitable for the purposes intended.

i) FERROUS METAL
To be cleaned and fettled.

j) SHOP PRIMING
Primer shall be of same manufacture as finishing paint. Refer to the Main Contractor on type and manufacture of primer for the whole of the project as specified under Paint and Schedule of Paint Finishes.

Whenever any ferrous metal member is cut or otherwise worked on site, exposed metal to be immediately coated with the same type of primer as specified.

k) GALVANISING
To be a thick hot dipped coating applied on completion of fabrication. Cold dipped galvanising is not acceptable.

l) ZINC COATING
To be applied after grit blasted treatment to base metal in accordance with A.S.C.K. 94 Class 3 and coated with an approved zinc based primer 0.0762 minimum thickness and factory stoved.

The Engineer may at any time require any materials to be tested in accordance with the requirements of the above listed specifications.

The Contractor shall, if required, promptly supply at his expense, test pieces as required by the Engineer.

5.3 SHOP DRAWINGS

Before fabrication is commenced, the Contractor shall prepare shop drawings. These drawings shall clearly show all sizes, dimensions, markings and corrections and set out the positions, sizes and lengths of all welds as necessary for the complete fabrication, assembly and erection of the steel work.

No fabrication shall be commenced for any variation or substitutions made in the shop drawings unless these have been approved in writing by the Engineer.

5.4 FABRICATION

CUTTING AND BORING

All members, plates, brackets, etc. shall be neatly and accurately sheared, sawn or profiled to the required shape as shown on the drawings.

After cutting, all rough edges shall be ground off.

PUNCHING AND BORING

All holes for bolts must be punched with holes 2.0mm larger in diameter than the bolts used.

Holes for bolts in material thicker than 16mm must be drilled or sub-punched and reamed.

BOLTING

All bolts used shall be of such length that at least one full thread is exposed beyond the nut after the nut has been tightened.

Where a nut or bolthead would bear on an inclined surface a bevelled washer of the correct shape shall be interposed between the two surfaces. Bevelled washers shall not be allowed to get out of position during fabrication and erection and for this purpose, may be spotted to the steel surface.

ELECTRIC WELDING

All manual welding shall be carried out in accordance with AS1554 or the equivalent B.S.S. If the Contractor is desirous of using semi or fully automatic welding equipment, he shall submit to the Engineer a complete specification of equipment, electrodes, fluxes. In addition, details of joint preparation, welding procedures and preheat. The contractor shall be required to demonstrate to the Engineer these procedures and shall have his written approval before commencement of fabrication.

Joint preparation shall be executed in accordance with the above mentioned code and as detailed on the drawings. Preparation shall be carried out by planning or machine flame cutting and the prepared surfaces shall be free from loose scale, slag, rust, grease, tears and fins.

Before commencing welding, sections to be butt welded shall be aligned within 1.5mm of their correct position. For fillet welds, the gap at the root of the weld shall not exceed 0.75mm.

All welds shall be of the finished sizes specified and shall be carried out in such sequence as will cause the minimum distortion of the parts welded.

Multiple run welds shall be carried out with each run closely following the previous run but allowing sufficient time for the proper removal of slag. Each run will be inspected and any unsatisfactory weld shall be cut out and remade to approval.

Welds shall on completion present a reasonably smooth and regular finish free from defects.

Unless otherwise shown, the minimum size of fillet shall be 6mm.

MARKING

All members of the structure to be assembled on the site shall be matched in accordance with the shop details submitted for approval.

Bolts and small or loose pieces shall be securely bagged or bundled and clearly marked for identification.

Bolts, nuts and washers are to be separately bundled for each size and each bundle clearly marked with the size and purpose of the bolts.

5.5 BUILDING IN

Build in as work proceeds all holding down bolts and other bolts required for steel to concrete or concrete to timber connections.

5.6 PRIMING

All new steelwork is to be shop primed with one liberal coat (see F02 j) SHOP PRIMING in accordance with manufacturer's specification before delivery to site and to existing steelwork before re-erection except where is to be encased in concrete.

PRIMER SHALL BE OF SAME MANUFACTURE AS UNDERCOAT AND FINISH COATS. See Clause L09 and S6.

5.7 DELIVERY

Take delivery of steelwork ex Factory and Transport to the site in good condition and replace any members bent or twisted in transit.

5.8 ERECTION

All erection shall be carried out by competent and experienced men and the Contractor shall take every care to safeguard the public, workmen and adjoining property.

All gear used shall be of adequate strength and shall comply with all Regulations current at the time and all steelwork shall be adequately bolted, guyed and braced to make the structure secure. The Contractor shall be held responsible for all damage caused to the structure, works or buildings during erection.

Minor details not shown on drawings shall conform to the requirements of AS 1250-1975 or the equivalent B.S.S.

In making corrections, drifting of unfair holes will not be permitted and holes not matching properly shall be reamed or drilled out and a larger bolt inserted with the Engineer's approval.

No member or part of member which has bent or distorted shall be erected in that condition. All straightening shall be done on the ground and checked by the Engineer.

All bolts shall be left tight and all bevelled washers and plates property positioned.

Column shall be wedged to line and level on steel or cast iron wedges and checked by the Engineer. After acceptance column bases shall be caulked to approval before wedges are removed.

Unless shown on the drawing, all columns shall be left truly vertical and correct to line and level.

Immediately after erection, each member shall be made secure by bolting, bracing or guys to approval by the Engineer.

Bracing shall be placed in position as soon as the dependent work will permit.

The Structure shall not be distorted to match any unfair holes.

5.9 MINOR PARTS

If neither the Specification, drawings nor schedule of quantities contains any particulars of minor parts, nor which parts are obviously necessary for the proper completion of the work, all such parts shall be supplied and executed by the Contractor without extra charge.

5.10 PROTECTION

5.10.1 NON FERROUS METALS

Non-ferrous metals, C.P. and the like to be protected after fixing and left clean, bright and free from any marks or defects on completion.

5.10.2 FERRPOUS METAL TO BE ZINC COATED

Ferrous metal shall be hot dipped galvanised or coated with an approved zinc based primer, a.b.s. where so specifically mentioned.

5.11 ALL OTHER FERROUS METAL

5.11.1 PREPARATION

All structural and/or decorative steelwork and all steel or ironwork generally including cleats, bolts, fixing and/or other parts shall be cleaned as follows:

(a) All grease or oil shall be removed by washing with white spirit.
(b) All mill scale, rust, dirt and/or other deleterious substances shall be removed by the use of chipping hammer and then wire brushing back to clean metal.

All surfaces shall be thoroughly dry before coating is applied.

5.11.2 COATING

Immediately after preparation work has been completed, apply type or primer as specified in Schedule of Paint Finishes strictly to manufacturers instructions.

The primer shall be spray applied except where written approval is given, by the Project Manager to substitute brushing for spraying.

After erection all damaged portions shall be cleaned back to the satisfaction of the Project Manager and made good to match original in thickness, texture and colour.

For decorative treatment of exposed metalwork and steelwork see "Painting".

5.11.3 ROOF FIXING CLEATS AND PLATES

Fabricate galvanised m.s. angle cleats as detailed on the Engineer's drawings and as shown.

Cleats and plates shall be cut and bent to profiles, shapes and dimensions shown, welds to be fully continuous fillet welds, drilled as required for fixings detailed.

Cleats, plates and bolts shall be galvanised.

Fixings shall be carried out as specified in "Carpentry and Joinery" as shown.

5.11.4 BRASS EDGING STRIPS

Provide and fix brass strips between differing floor finishes and to edges of mat wells as shown in drawings.

Fabricate strips from extruded brass bar. Separating strips shall be full width of openings and full length of junction of finishing materials. Joints in bars shall be avoided as far as possible. Top edge of bars shall finish flush with finished floor surfaces. Epoxy grout bars in.

5.12 ALUMINIUM DOORS AND WINDOWS

Refer to Door and Window Schedules.
All aluminium work, fixings and glazing must conform with.

Doors, windows, fixings	: NZS 3504 + 4201
Glass thicknesses	: NZS 2258 : 1969
Earthquake	: NZS 4203 : 1992, Zone Factor 0.9
Hurricane	: AS1170.2 57m/second basic wind speed, adjusted for height, terrain etc.
Expansion and Contraction	: Due to sun and rain etc.
Electrolytic action/Lime action	: Between aluminium and steel/concrete
Anodised Finish	: Powder coated black

Stainless steel screws, corners mitred, joints caulked, drainage points provided, PVC weather-strip gasket between sash and frame, frames set in continuos non-setting sealant.

Design Data and Calculations	: provide for approval before fabrication
Shop Drawings and Section Samples	: provide for approval before fabrication
Guarantees/Warranties	: For 2 years at Practical Completion
Fabricator	: Guarantee for Material Performance
Installator	: Guarantee for Installation Workmanship

6.0 TIMBER

6.1 GENERAL

6.1.1 TIMBER GRADES

Unless otherwise specified, all timber shall conform to the requirements of the "National Grading Rules for Fijian Timbers", viz:

Joinery : selected timber for high grade joinery, mouldings, cabinet works, and other uses requiring clean timber.

No. 1 Dressing: timber for machining into mouldings and joinery, flooring, weather boards, lining and other uses which will generally be covered or painted.

- Fiji - F - Select

No.2 Dressing: timber for utility shelving, sarking, rough lining and sheathing and high grade concrete formwork.

- Fiji - F - Standard

No. 1 Framing: timber for high grade framing and general utility purposes for use in buildings of first class construction

- Fiji - F - Select

No. 2 Framing: timber for general framing and utility purposes, but suitable in first class construction for various members in non-bearing positions and other applications where the unsupported length is not excessive.

- Fiji - C - Standard

The use of Fiji Pine (P. Caribaea) " shall be governed by the requirements of the "Provisional National Grading Rules for Fiji Pine (P. Caribaea) "timbers and pine poles. Fiji Pine timber from TROPIK WOODS LTD., to conform with that Company's current grade Specifications.

The use of American, Canadian, Australian and New Zealand timbers shall be governed by their respective rules, regulations, gradings etc. but shall not be less than Fiji Standards.

The use of Fiji Mahogany for finishing applications should be governed by the provisions of the Fiji Forestry Department's draft "Mahogany Grading Rules".

The use of other exotic timbers for structural members shall require the approval in writing of the Structural Engineer.

6.1.2 TIMBER MOISTURE CONTENT

All joinery and dressing timbers shall conform with the following requirements:

FOR INDOOR NON - AIR-CONDITIONED LOCATIONS:

Wet Zone	(e.g. Suva, Nausori, Lami)	= 17% + / - 3%
Intermediate Zone	(e.g. Sigatoka, Labasa)	= 15% + / - 3%
Dry Zone	(e.g. Nadi, Lautoka)	= 14% + / - 3%

Unless otherwise specified, moisture content of framing timber at time of delivery shall not exceed 25%.

FOR INDOOR AIR - CONDITIONED LOCATIONS

In processing of timber for air conditioned premises, kiln drying initially to 10% moisture content is recommended, followed by use as quickly as possible after seasoning. If a delay of more than a week is likely to arise before use, material should be block stacked and well wrapped with plastic sheeting. Immediately after use, all timber surfaces should be given a sealer coating to limit moisture intake, pending installation and operation of the air conditioned facilities.

Preservative shall be TANALITH NCA or CELCURE AN for all concealed, painted and stained work unless otherwise specified.

Preservative shall be IMMUTAN F or CELCURE PA for all joinery, varnished and polished work unless other wise specified.

Minimum charge retention of preservative (kg/m3) based on treatable volume of timber:

HARDWOODS - TANALITH or CELCURE AN:
Hazard 1 : 3.5 kg/m3 minimum retention/treatable volume.
Hazard 2 : 7.0 kg/m3 minimum retention/treatable volume.
Hazard 3A: 18.0 kg/m3 minimum retention/treatable volume.
Hazard 3 B: Not recommended
Hazard 4 : 48.0 kg/m3 minimum retention/treatable volume

SOFTWOODS - TANALITH NCA or CELCURE AN:
Hazard 1 : 3.5 kg/m3 minimum retention/treatable volume
Hazard 2 : 7.0 kg/m3 minimum retention/treatable volume
Hazard 3A : 12.0 kg/m3 minimum retention/treatable volume.
Hazard 4 : 48.0 kg/m3 minimum retention/treatable volume.

HARDWOODS - IMMUTAN F OR CELLULAR PA:
Hazard 1 : 1.6 kg/m3 minimum retention/treatable volume.
Hazards 2, 3A, 3B and 4 : Not approved.

SOFTWOODS - IMMUTAN F or CELCURE PA:
Hazard 1: 1.6 kg/m3 minimum retention/treatable volume.
Hazards 2, 3a, 3b AND 4 : Not approved.

NOTE: Retention's quoted for "Softwoods" refer only to dakua makadre, dakua salusalu, yaka, Mauna, kuasi, Fiji and slah pines and to any coniferous imports. All other commercial species (e.g. Kauvula, Kaudamu) are "Hardwoods" in the context of the above table.

The hazards 1-4 above are defined as follows:

Hazard 1: **Out Of Ground Contact And Continuously Protected From The Weather**. Situations where timber is continuously protected from the weather, adequately ventilated, free of contact with the ground, damp masonry, etc., e.g. furniture timbers, internal panelling, interior framing and roofing timbers, etc.

Hazard 2: **Out Of Ground Contact Not Continuously Protected From The Weather** Situations where timber is not in ground contact but is not continuously protected from the weather, or situations as in continuous contact with damp masonry in unventilated groundline floors, other damp situations, exposed verandah floors, garden furniture, barge boards, etc.

Hazard 3: **In Ground Contact**. Situations where timber is in continuous contact with the ground. This end-use category is subdivided into two commodities based on the acceptable life of different commodities and their relative values:

3A) Low risk, low value items, e.g. fence posts.

3B) High risk, high value items, e.g. house piles, poles for pole frame housing, transmission poles etc.

Hazard 4: **Marine Uses**

NOTE: Situations arise in which the timber end-use does not obviously fall into one hazard category or the other. In such circumstances, for permanent structures of first class construction the more severe hazard should be assumed and the higher level of treatment this implies adopted. For example, weather-boarding, properly painted (primer, undercoat, finishing coat) and maintained, theoretically would qualify as hazard 1 - 'out of ground contact, continuously protected'. In practice, however, this frequently could not be guaranteed and hazard 2 - 'out of ground contact, not continuously protected' would be considered the appropriate one.

6.1.4 TIMBER SIZE TOLERANCES

Size tolerances shall conform to the "Specification for Metric Dimensions for Timber in Fiji", as detailed by the Timber Industry Sub-Committee of the Metrication Board.

6.2 PLYWOOD GRADES

Unless otherwise specified, all plywood shall conform with "Fiji Forest Industries Limited Plywood Manufacturing Standards".

Select, good in both faces, Select, good in one face, or Standard Grade; interior, exterior, structural, marine or formwork grade; and thicknesses; shall be used as specified in the drawings.

Select Grade includes "no joints in face veneer" for clear natural finish.

6.3 JOINERY

All joinery work shall be finished with sandpaper and/or scraped by hand to a smooth finish ready to receive paint, oil or polish finishes specified in 'Painting".

For polish finish, timber shall be carefully matched for uniformity of colour, grain and texture to ensure uniform finish.

Damage: The Builder shall replace any joinery work k that is discoloured by mortar or otherwise damaged and shall adequately protect joinery during building operations.

6.4 WORKMANSHIP

Frame all work together the best trade practice and workmanship including checking, housing, halving, mitering, spiking, bolting, screwing as required for first class work. All framing shall be square and plumb or level and set to required lines. Joints shall be close-fitting with an even bearing over the entire contact surfaces. Provide all fillets, packing, moulds for proper completion of work. Provide all nails, screws, bolts, coach screws, fastening and powder-powered fixings as required.

6.5 PRIMING

Prime all end-grain 2-3 thick coats of primer before assembly.

Prime all joints before assembly and all faces of timbers and timber in contact with concrete surfaces and metalwork with one thick coat of prepared primer of an approved brand and set on D.P.C. before fixing timber. The Primer shall be of the same manufacture as the Undercoat and Finishing Coats. Refer to Clause L09 PAINT TYPE.

6.6 FIXINGS

Generally, all screws, nails, bolts and other fixings, incidental to, or necessary to complete this Section of the work shall be allowed for and be of ample length and gauge necessary for secure fixing. No joinery shall be fixed to concrete work until such concrete work have been thoroughly cured and dried.
Nails: shall be hot dip galvanised for use in treated framing timbers and all exterior fixings, and bright steel for interior use. In framing timber nails shall penetrate the holding timber at least half their length. Interior finishings timbers shall be fixed with brads. Drill for nails to avoid splitting wherever necessary.

Flashings to larger penetrations than 00mm dia. and to columns shall be carried out in 0.61mm thick, colorbond zincalume steel as shown on drawing strictly to Manufacturer's Instructions.

6.7 DEFECTIVE WORK OR MATERIALS

All timber and plywood showing excessive shrinking or cracking or otherwise showing defects structurally or visually shall be removed at the Contractor's expense and the work replaced to approval.

6.8 PROTECTION OF WORK

All finished or partly finished work shall be protected from water damage, discoloration and other surface injury.

7.0 METALWORK

7.1 PRELIMINARY

Refer to the Preliminary and General clauses of this specification which shall be read in conjunction with and shall apply to this section of the work.

7.2 SCOPE

The Metalworker shall be responsible for the provision of and where specifically mentioned the fixing of all lugs, brackets, bolts, washers, waterbars, handrails and all other metalwork fittings mentioned herein, shown on the drawings or as required to properly complete the work. Any item not specifically mentioned for fixing under this section shall be fixed by the General Contractor.

7.3 MATERIALS

Generally all materials used in the fabrication and completion of all items covered by this trade section shall be new and the best of their respective kinds and shall comply with all conditions of the N.Z.S. 309 0r B.S.S. applying to them.

7.3.1 MILD STEEL

All rolled sections, sheet or tube and rods shall be of British manufacture and shall fully comply with the requirements of N.Z.S.S. 309 and B.S.S. 15, 1948.

7.3.2 BRASS AND BRONZE

Strap or sheet Bronze and Brass shall be rolled or extruded from best quality copper and zinc alloy and shall be chemically toned and fixed to approved antique finish.

7.3.3 WELDING

Welding rods shall be as described in 'Structural Steel' section for steelwork welding. Other materials may be welded or brazed where approved and certain steelwork may be brazed where stresses are not excessive.

7.3.4 BOLTS

All black bolts, nuts and washers shall conform with the requirements of B.S.S. 916.

7.4 WORKMANSHIP

All items included in this trade section shall be fabricated in fully equipped workshops by qualified tradesmen who are specialists in the particular type of work required. The Designer reserves the right to inspect all such work while in the process of fabrication.

All work shall be true to line and carried out as shown on the drawings, cut, drilled and assembled by means of welding, bolting or other suitable methods in accordance with best trade practice.

All holes for screws or bolts shall be no larger than is necessary and shall be countersunk where required.

All metalwork exposed to view shall be neatly finished and where within reach shall present no rough or sharp edge etc.

Arrises shall be clean and right angles shall be true to square. Where the design or function requires flat surfaces they shall be true planes to the minimum appropriate tolerances.

A first class standard or finish is required for all items included in this trade section.

Take all necessary steps to prevent electrolyte corrosion between dissimilar metals using separate media as required.

7.5 ZINC SPRAY OR GALVANISING

All external mild steel items are to be zinc sprayed or galvanised after fabrication. Immediately after cleaning apply a zinc coat to a minimum thickness of 0.125mm in accordance with the requirements of N.Z.S.S. 1297 Part 1: 1965.

After erection and completion of any field welding make good any damaged areas with an approved zinc rich paint.

7.6 BALUSTRADES

All metal balustrades and handrails shall be fabricated according to site measure. Liaise with the Contractor for all fixing holes in concrete.

7.7 TRENCH COVER

Provide 1200 x 900 x 6mm galvanised chequer plate trench cover with 50 x 50mm m.s. angle frame to cover the cable trench where it extends outside the transformer room.

7.8 STAIR FRAMING AND BALUSTRADES

Construct balustrades to stairs as detailed.

7.9 COMPLETION

Leave all work ready for use or in a state to receive applied finish as the case may be.
Remove all off-cuts, nibbling or drillings and rubbish from the site on completion.
Adequately protect completed finished work until main contract is completed.

8.0 METAL WINDOWS

8.1 SCOPE

Work in this section includes the manufacture and delivery to site of metal windows and doors complete with metal glazing beads, weather strips, packings, fixings lugs and packaging as required, for site assembly and installation and servicing and adjustments; for supply and fixing all hinges and hardware including handles, stays, and operating gear; and for glazing which should comply with NZS 4211.

Aluminium work shall comply with the standards set by the metalwork section of this specification.

8.2 MANUFACTURE

Metal windows and doors shall be manufactured by a reputable manufacturer approved by the Architect.

Metal sections as shown on the drawings are diagrammatic only. Tenderers are to confirm the suitability of their particular sections for the intended use. Tenderers shall submit with their quotations a specification, including the type of sections to be used and the hardware.

8.3 GLAZING

All aluminium windows and doors shall be glazed by the window manufacturer. Windows and doors may be factory glazed.

Glazing shall be in accordance with the general standard set out in the Glazing section of this specification.

All glass shall be retained by neoprene gaskets in aluminium beads.

8.4 MATERIALS AND FINISH

Unless otherwise shown metal windows and door frames shall be aluminium.

Anodising and power coating shall be in accordance with NZS 3503.

8.5 CO-ORDINATION

Prior to manufacture details and dimensions shown on the drawings should be confirmed and agreed with the Main Contractors as being correct for the openings which he will be providing.

Prepare scale and detail drawings of all aluminium units including weathering and ventilation details for checking of dimensions and details before starting fabrication. Provide Structural Engineers Certificate to verify design and details. Thsese should comply with requirements as stated elswhere. (refer to clause SO1)

8.6 PROTECTION

Provide adequate protection during transportation, erection and after erection to completion.

8.7 ERECTION ACCESS

The Main Contractor shall provide scaffolding or other temporary supports as may be required by the sub-contractor for the fixing, glazing and caulking of this work. This is to be arranged with the contractor at the time of tendering.

8.8 CERTIFICATION

Provide certificate signed by a Registered Engineer that the entire window system and all associated fixings have been designed in accordance with all relevant By-laws and Codes and that the manufacture and installation of the windows has been in accordance with the design.

8.9 FIXINGS

The window sub-contractor shall provide all fixings.

Ensure that a suitable separating medium is provided to prevent direct contact between the aluminium and concrete work.

The Main Contractor shall provide all pockets, chases, holes, etc. as required by the sub-contractor.

8.10 CLEANING

The Main Contractor shall be at all times responsible for the final condition of metal windows erected on site and shall make provision for all wet materials such as plaster, concrete, paint, etc. to be removed from metal within 24 hours.

The Main Contractor shall make necessary arrangements with wet trades to protect aluminium and glass from contamination and damage as a result of their work.

At no time shall the Main Contractor allow steel wool to be used to clean aluminium.

8.11 COMPLETION

On completion the Main Contractor shall clean and polish all windows, cladding panels and doors,taking particular to remove dust and dirt from sill channels.

9.0 CARPENTRY

9.1 PRELIMINARY

9.1.1 Refer to the applicable Fiji Standard From of Builidng Contract and the Preliminary & General clauses which will also apply to this section of the work .

9.1.2 Standards: The following standard shall form part of this specification:

NZS 1900 Chapter 6.1 & 9.1

9.2 MATERIALS

9.2.1 General: All materials shall be the best of their respective kinds. Timber used in this contract shall be the best quality, in accordance with the above mentioned standard. Timber shall be well seasoned, have the correct respective moisture content, free from shakes, bad knots and any other defects. Timber used shall be as specified unless specifically mentioned in the drawings to the contrary.

All dimensions on the plan are relative to rough swan sizes unless stated to the contrary. All proprietary linings, fittings, material, etc. shall be of an approved manufacture and design. All nails, bolts, etc. used shall be hot dip galvanised unless stated to the contrary.

9.2.2 Ordering of materials: Contractor shall place orders for all timbers within 2 weeks of contract commencement. Any claims arising from delay in ordering will not be allowed. Notify immediately if any timber size or species is unobtainable.

9.2.3 Types of Timber: Unless specified otherwise the following timbers shall be used - exposed timbers shall be of one species only:

Roof framing	Exposed beams Rafters & Purlins	treated Dakua Makadre treated Kavula
Sarking		treated Dakua Makadre treated Dakua Salusalu Salsalu treated Kaudamu
Weatherboards	External	treated Dakua Makadre treated Dakua Salusalu treated Kaudamu treated Kauvula
Floor framing	Bearers, joists	Rosarosa, Yasiyasi, Sacau treated Kavula
Wall framing		treated Dakua Makadre treated Kaudamu treated Kauvula
Flooring	Exterior	Sacau, Vesi, Yasiyasi
	Interior	Damanu, Sacau, Yasiyasi Rosarosa.
Balustrades	Exterior	Saucau, Vesi, Yasiyasi Rosarosa.

Doors	Exterior	treated Dakua Makadre treated Dakua Salusalu
	Interior	treated Kaudamu treated Kauvula
Frames		terated Dakua Makadre treated Dakua Salusalu treated Kauvula
Sills		Rosarosa, Sacau, Vesi Yasiyasi
Windows	Frames & Sashes	treated Dakua Makadre treated Dakua Salusalu
Sills		treated Dakua Makadre treated dakua Salusalu Rosarosa, Sacau, Vesi Yasiyasi.
Stairs	Exterior & Interior	Rosarosa, Sacau, Yasiyasi Vesi

9.2.4 TREATMENT

All timbers noted above as being treated shall have Tanalith NCA pressure treatment as specified at end of this section.

9.2.5 MOISTURE CONTENT

The moisture content of the timbers shall be strictly adhered to. The Designers reserve the right to submit any timbers to a recognized testing authority for testing and report.

The Contractor shall replace at his own expense any timber which has been damaged or shrunk on finished work caused through the use of imperfectly seasoned timbers.

Generally the moisture content of framing timbers shall not exceed 18%.

9.2.6 NAILS AND FASTENINGS

All brads, nails etc. shall be best quality of the appropriate gauge, strength and shall be long enough to enter the second timber fro at least half length before punched. Screws shall be of sufficient length and gauge for their purpose. Screws for door furniture and other iron mongery shall be of material and pattern to match the various fittings. All screws exposed to the outside shall be solid brass. All nails and bolts shall be galvanised.

9.3 WORKMANSHIP

Workmanship shall be of the highest standard in accordance with the best trade practice. The whole of the work shall be properly framed and the various sections securely spiked and/or strapped together to withstand hurricane conditions. All finished of partly finished work shall be protected from discolorations, surface injury or other damage from exposure to weather or other causes. All nail holes in exposed work shall be punched.

9.4 EXTENT OF WORK

This section includes all carpentry work shown on the drawings. It also includes waiting upon all trades, cutting, boring, nogging, as they may require for the proper completion of the whole contract.

9.5 PRIMING & SEALING

The external face, ends and butts of all external finishing timbers and all finishing timbers, frames, etc., in contact with concrete or blockwork shall be primed before fixing.

All rafters, beams and sarking which are exposed shall have a priming coat applied before erection.

This clause should be read in conjunction with the Painting Section for reference to those timbers requiring different types of priming. It is the Contractor's responsibility to ensure that the timber being finished with oil stain or varnish shall receive their first coat.

9.6 FINISH

Remove all arrises, rough and uneven patched, hammer marks, machine marks and other surface defects to the satisfaction of the Designers before any finishing medium is applied.

9.7 DAMP PROOF COURSE

Between all faces of framing in contact with concrete or concrete blockwork place a 3 ply bitumenous fabric.

9.8 ATTENDANCE

Wait upon all trades, cut or bore timbers as they may require. Provide and fix all blocks, supports and the like. Reduce to a minium the cutting of structural members and in no circumstances cut into or check rafters, beams and purlins within the middle third of the length. Attachments to concrete and concrete blocks shall be made by means of screws and plate and plugs, bolts either built in or engaging and expanding sockets of an approved design or as detailed.

9.9 PROTECTION

All timber and joinery upon arrival at the site shall be immediately stacked. All joinery, kiln dried timber and all dressed timber shall be protected from the weather and from damage continuously during the contract before and after installation.

9.10 TREATMENT

Refer to section G for appropriate treatment for different uses.

9.11 HARDWARE

Refer to schedule of monetary allowances.

9.11.1 All hinged doors unless otherwise specified will be hung on 3/100mm brass butt hinges.

Door furniture shall be positioned as follows unless stated otherwise on the drawings.

Knob & Furniture	800 off floor
Lever & Furniture	1100 off floor

All handles, puffs, recessed pulls, should always be mounted opposite the fixed rail.

9.12 PREPARATIONS FOR HANDING OVER

Before handing over the building to the Owner, the Contractor shall properly prepare the building for occupation and use. Contractor shall remove all rubbish and gear, check and adjust all hardware, present all keys and in all areas where linings are applied, employ an approved firm of commercial cleaners to wash down all washable surfaces and polish all floor coverings. All glass throughout the building shall be washed and left free of marks, paint spots, etc. and all floors where no floor coverings are applied will be swept and hosed down after which all floor channels, traps, floor drains and sumps shall be cleaned out.

All foreign materials, nails, silt, etc to be removed from all gutters. Also refer to Preliminary and General clauses on Completion.

9.13 JOINERY

Take delivery of all joinery and fix in accordance with good trade practice in accordance with positions as shown on the drawings.

9.14 FINISHES

All dressing grades shall be machine dressed and in addition all finishing timbers shall be scraped and sand papered by hand to smooth even surface ready to receive painting and polishing. No machine marks, hammer marks or surface defects shall be visible in finished work. Punch all nails and remove all arrises. Where polished work is specified, the timber shall be carefully matched for uniformity of colour grain and texture to ensure a uniform finish.

9.15 RESEWN TIMBERS

Timbers scheduled on the schedule of finishes shall be timbers which have been re-sawn with a band saw to remove circular mill saw marks.

11.0 DRAINAGE

11.1 PRELIMINARY

11.1.1 General: Refer to the applicable Fiji Standard Form of Building Contract and the Preliminary & General clauses which will also apply or this section of the work.

11.1.2 Standards :All drainage work shall conform to the New Zealand Plumbing and Drainage Regulations 1959 and shall be carried out by a licensed Drainlayer, be strictly in accordance with the drawings and this specification and to the satisfaction of the Local Authority Inspector and the Architect.

Code of Practice for the Installation of Unplasticised PVC Pipe Systems, March 1959.

11.2 MATERIALS

All materials shall be the best of their respective kinds and if necessary are to be submitted for approval before installation.

11.3 WORKMANSHIP

All work shall be carried out in a neat and careful manner in accordance with the best trade practice and only experienced tradespersons shall be employed. Joints in PVC pipes shall be with solvent cement or O rubber rings. Interiors of pipes and fittings shall be thoroughly cleaned as the work proceeds. Mains under buildings shall be bedded and encased in concrete. PVC pipes are to be wrapped in polythene before being encased.

11.4 EXTENT OF WORK

Carry out all drainage work as indicated on the drawings as specified herein and as necessary to complete the full system of drainage envisaged.

11.5 PVC DRAIN

Where shown on drawings supply and lay Granite S'Lon unplasticised PVC pipes complying with qualitative clauses of BS 3506 jointed with rubber ring seals complying with BS Document No. 67/17406.

Bed pipes into 100 mm layer of compacted sand and completely surround with sand to same thickness.

Lay and joint drains in strict accordance with the manufacturer's specifications.

11.6 CONCRETE DRAINS

Where shown on the drawings supply and lay Humes precast concrete pipe drains in strict accordance with the manufacturer's specifications.

11.7 SURFACE DRAINS

Where shown on the drawings construct open concrete drains.

11.8 GULLY TRAPS

Gully Traps shall be set on and be encased in concrete and shall finish 75mm above ground level and be complete with cast iron gratings. Waste pipes shall discharge below the gratings. Gully traps shall be glazed earthenware, PVC or similar.

11.9 INSPECTION CHAMBERS & MANHOLES

Where shown on the drawings construct inspection chambers and manholes to Local Authority's approval. Neatly bed discharging pipes into the inspection chambers at the correct levels. Neatly bench plaster at 1 in 6 slope around channels and Interior of Inspection Chamber. Fit with approved air-tight cast iron covers complete with perimeter frame and recessed handles.

11.10 GRATED STORMWATER SUMPS & GRATED DRIVEWAY CROSSINGS

Construct where shown on the drawings and to standard detail. As per approved plans

12.0 SOLID PLASTERWORK

12.1 PRELIMINARY

12.1.1 General: Refer to the applicable Fiji Standard Form of Building Contract and the Preliminary & General clauses which will also apply to this section of the work.

12.1.2 Standards: The following standards shall form part of this specification:
NZSS 2129 1967 Class A
NZSS 1844

12.1.3 Protection: All dressed woodwork, finished surfaces, windows, glass, etc., shall be effectively protected against droppings or damage caused by plasterwork or mortar.

12.2 MATERIALS

12.2.1 Cement: All approved brand of grey cement to conform to the above standards shall be used unless otherwise specified.

12.2.2 Sand: Sand shall be river or pit sand, coarse grained, sharp and free from saline, vegetable or earthly matter to pass through a 6 sieve for finishing coat and a 4.8 sieve for other coats.

12.2.3 Lime: Lime shall be best quality hydrated lime run 24 hours before use. Other approved plasticisers may be used.

12.3 WORKMANSHIP

The whole of the plastering shall be carried out by experienced and skilled tradespersons only and the whole of the work shall be guaranteed. Wherever possible plastering shall be done after carpentry work is complete to avoid vibration. All mouldings, drips, weatherings, etc., shall be run into detail with clear cut angle quirks. On completion work shall be left free from cracks, blisters or marks, even in colour, free from drumminess to the satisfaction of the Architect. Where necessary make good after other trades. Any plasterwork which has cracked or drummy shall be chipped back and replastered at the Contractor's expense.

12.4 PROPORTION AND MIXING

All plaster shall be thoroughly mixed and each batch shall be used within 20 minutes of being mixed. Retempering or remixing after the initial set shall not be allowed. Where approved the proportions specified herein may be varied to suit the grading of sand available.

12.5 PREPARATION OF SURFACES

Concrete and blockwork to be plastered shall be wire-brushed to remove laitance. All surfaces shall be thoroughly wetted with a hose half an hour before each coat. It is the Contractor's responsibility to ensure that the base on which is to be plastered is up to standard. Check blockwork prior to plastering to ensure that the shrinkage has occurred in the mortar joints, that these joints are raked and repointed. Co-ordinate and co-operate with the Blocklayer in this respect.

12.6 CURING

At least 7 (seven) days shall be allowed between each coat and each coat must be allowed to dry thoroughly and so substantially complete the shrinkage before the final coat is applied.

12.7 PATCHING

No plastering is to be commenced until all holes, electrical chases, etc., have been cut.

12.8 FIXING OF TILES

Allow plasterer to cure at least 7 (seven) days prior to fixing. Fix tiles to walls with CTF adhesive in accordance with the Instructions of the Manufacturers - Australian Building Adhesives Pty Ltd.

Tiles to be laid in grid pattern. Centre tile field in both directions in each space so that minimum width of cut tiles is greater than a half tile. Use best trade practice and provide round edge, round edge return, as appropriate.

12.9 QUARRY FLOOR TILE BEDDING

Allow concrete floor to cure after 28 (twenty-eight) days prior to tiling. Floor to receive tiles shall be cleaned. Bed tiles in “Quarry Fix” strictly in accordance with instructions of the manufacturers, Australian Building Adhesives Pty Ltd.

13.0 FLOORS, WALLS AND CEILING

13.1 MATERIALS

Sand, Cement, Water, Lime, etc., a.b.s. Preamble aggregates - in accordance with S.A.A. Codes AS No. A77. Glazed ceramic tiles, asbestos cement sheeting; vinyl sheet flooring; vinyl tiles; semi glazed tiles; special hardened floor surfacing; waterproof wall surface finishes.

13.2 GENERALLY

All materials and workmanship shall be in accordance with relevant codes and A.S. specifications. Finishes shall cover full area of Room and Area from wall to wall, taken under fixtures and fittings unless otherwise specified.

Location and extent of Finishes shall be as indicated on the Schedule of Finishes.

13.3 WORK PROGRAMME

Work shall be pre-planned and executed to meet the needs of trades and services.

Floor waste, penetrations and like nature of items to be built-in shall be determined prior to commencement of work.

Any special finish which may be carried out by a specialist sub-contractor, such sub-contractor must be advised well in advance of programme requirements.

While work shall follow complete work sections, premature finishing coatings must be avoided.

13.4 ORDERING, DELIVERY AND STORAGE OF MATERIALS

Deliveries shall be made well in advance of installation.

Make cappings, ridges and accessaries as detailed and as required, in same material, finish and colour as decking, lapped 200mm at joints, screwed and / or riveted and sealed to manufacturers instructions and Architects approval with neoprene washers and recommendation.

Prior to applying paving or toppings, thoroughly clean down surfaces with high pressure water jets. If any laitance or dirt remains, clean the surface with muriatic acid by lightly brushing with soft broom. After bubbling action ceases, thoroughly flush the surface with water and brush to remove all traces of treatment, remove by chipping or hacking.

When surface is dry, apply a neat cement slurry scrub thoroughly into the surface to wet it uniformly, to displace air bubbles and to incorporate loose particles still left on the surface.

Cement slurry shall be applied no longer than fifteen minutes before applying screeds or topping and must be protected from premature drying out during the period.

All surfaces to be prepared for an applied finish must have a good key. Off-form concrete surfaces, where concealed, must be roughened to form a suitable key.

Finishing shall be set true, flat and plumb, free from blemishes. No uneven surfaces or surface irregularities will be accepted.

All conduits, pipes, plugs, etc. shall be chased and fixed before applied finish commences.

Mortar shall be mixed in batches no greater than can be used within one hour of mixing. All mixing boxes and mixes are to be thoroughly cleaned of all set or hardened materials between batches.

13.5 PROTECTION

Protect work as necessary and as may be required by the Architect.

Protect new flooring after laying by completely covering with waterproof building paper lapped 100mm at joints. Covering to remain until floor is ready for final polishing.

Outer angles subject to damage shall be adequately protected; maintain protection until not further required.

Any damage or disfigurement of finishing materials due to inadequate protection to be made good by the Contractor at his own expense.

13.6 INSPECTION OF SUB-BASE

It shall be the responsibility of the Contractor to examine floor and wall surfaces for dampness, undulations and other defects. Such surfaces to be remedied before the finishes commence.

Commencement of the finishing work shall signify acceptance of the sub-surface for satisfactory completion of laying of the particular finishing material.

13.7 SAMPLE PAVING

Sample areas shall be prepared in locations as directed.

13.8 CEMENT RENDER AND PLASTER

Sand used for render shall be clean and sharp and free from salts and other impurities. Render shall be 3:1 sand cement mix, to thickness of 10mm.

Care shall be taken during rendering to prevent the splashing of adjacent surfaces and finish work. Immediately remove any accidental dags and splashes and wash off stains.

Point up and make good after all other trades to match adjacent surfaces and finish with neatly 'V' joint. Render of free edge to be splay cut on line. For arises, to pencil round.

Float down with plastic sponge, float to be fine even finish free from marks and blotches.

Render should not be allowed to dry quickly by the hot sun and strong drying wind by wetting with a fine spray of clean water at frequent intervals.

After render has set, grind down with a fine Carborundum stone to an approved smooth finish free of sand and other defects.

In addition to areas listed in the Schedule, all areas scheduled to receive wall tiles shall be rendered a.b.s.

13.9 QUARRY FLOOR TILES AND MOSAIC FLOOR TILES

Quarry floor and mosaic tiles shall be supplied and laid to all areas as shown in drawings.

Tiles shall be of select make, colour and finish with 150 * 100 * 25mm grooved nosing tiles to steps treads and door thresholds. See Schedule of Materials and Finishes.

Lay tiles on bed of 3: 1 sand: cement mortar generally maximum of 30mm and minimum 15mm thick, lay floors level or graded evenly to fall outlets where required. Joints shall be grouted full and finished smooth and flush with Aba Grout or as recommended by the tile manufacturer.

Contractor to allow for expansion joints at every 6 sqm in their price.

13.10 CERAMIC WALL TILES

Ceramic wall tiles shall be supplied and laid to all areas as shown in drawings.

Tiles shall be of select make, colour and finish. See Schedule of Materials and Finishes.

Cut tiles to be sawn. Jointing to be in level courses, straight and plumb.

Lay tiles in adhesive or mortar recommended by the tile manufacturer and strictly to manufacturer's instructions.

Tiles shall be set out symmetrically and arranged to minimize cutting. Tiling shall be carried continuous behind sanitary fixtures. Joints shall be grouted full and finished smooth and flush with Aba Grout or as recommended by the tile manufacturer.

Rounded edge tile are to be used for all edges.

13.11 EXPOSED AGGREGATE FINISH (not required)

13.12 VINYL FLOOR TILES

Vinyl tiles shall be supplied and laid to all areas as shown in drawings.Tiles shall be of select make, colour and finish. See Schedule of Materials and Finishes.Concrete floor must be ground level to tolerances allowed and accepted before laying of tiles.Tiles shall be set out symmetrically and arranged to minmize cutting.

13.13 GIBRALTAR BOARDS

Refer to Schedule of Material and Finishes which describes the thickness of sheet and finish required. The boards are to be fixed strictly to manufacturers instructions, contractors attention is drawn to the following documents that are available from the manufacturer:

1)	Level of Gib Board Finish	(42) Rf7 November 1992
2)	Gib Board Fixing and Jointing Instructions	4- Rf7 (D6) November 1992
3)	Gib Board Stopping and Finishing Systems	(4.2) Rf7 (t4) November 1992

14.0 PAINTING

14.1 GENERAL

This part includes all coatings to be carried out other than those specifically provided for in other parts.

Work shall be pre-planned and executed keeping in mind the needs of other trades.

Premature finishing coats should be avoided.

Contractors particular attention is drawn to the coverage recommended by the manufacturer for different coats that make up the coating system.

14.2 MATERIALS

14.2.1 MANUFACTURE

ALL PAINTS MUST BE ANTI-MOULD, ANTI-FUNGAL PAINT

All paints and coatings shall be of the same manufacture specified hereinafter and as approved by the Architect and comply with current S.A.A requirements for their respective kinds. All paints, primers, undercoats and finishing coats are to be lead - free. All paint, undercoat, primer, etchprimer, etc. shall be obtained from ONE manufacturer. Refer to Schedule of Paint Finishes for the approved suppliers. All painting is to be carried out to manufacturers instructions.

14.2.2 CONTAINERS

All materials shall be delivered in sealed labelled containers of the manufacturer of the paint.

14.2.3 PRIMING

ALL SURFACES MUST BE INSPECTED BY THE ARCHITECT BEFORE PRIMING AND BETWEEN COATS.

All timber and plywood with mould and fungal growth shall be rejected and removed from site.

All woodwork and metalwork to be painted shall first be primed.

Priming for woodwork having opaque finish shall be an approved, first quality Titanium primer in oil. All end grain, exposed or concealed, must have two coats of primer.

Treatment of woodwork with clear plastic and natural timber finishes shall be as recommended by the manufacturer of the relative coat finish.

Priming for metalwork and steelwork shall be a.b.s

14.2.4 UNDERCOATS

To all finishes shall be those recommended by the manufacturer of the relative coat finishes.

14.3 DELIVERY AND STORAGE OF MATERIAL

Delivery shall be made well in advance of application and shall be stored under cover or in sheds on timber platforms.

14.4 WORKMANSHIP

14.4.1 Coating shall not be applied to any surface which is not thoroughly dry (except where recommended by the manufacturer) or acceptable.

All surfaces shall be inspected and where defective, made good before work proceeds.

Application of paint or stains or clear finish will be considered as acceptance of surface conditions for reception of materials by both contractor and respective paint manufacturer.

14.4.2 CLEANING UP BEFORE PAINTING

Prior to commencement of painting, the area to be painted plus the surrounding area shall have all debris removed and then swept clean and left for a period of 4 hrs after which all dust shall be removed.

14.4.3 COMMENCEMENT

Generally no painting shall commence until such time as the work of all other trades has been completed within the area to be painted.

Where it is necessary to lay a floor covering after the painting has been completed, the last coat shall be applied after the laying of the floor.

All adjacent finishes shall be adequately protected and any paint splashes removed without damage to the area affected.

All work shall be performed by skilled tradesman in a neat workman like manner, cutting in and finished edges shall be clean and straight.

All material shall be mixed and applied in strict accordance with the manufacturers instructions.

Concrete and paving which have been splashed with paint shall be taken up and relayed and all costs shall be borne by the contractor. If walls are damaged in effecting any relaying, they shall be repainted at the contractors expense.

Concrete and plaster surface shall be ground down before painting.

Surfaces shall be rubbed down before painting. Each coat shall be wet rubbed down and / or washed down as required prior to the application of the following coat. The exception is stain coating which is not rubbed back between coats.

Application of paint shall not be carried out in wet and / or windy weather. The later is to be at the discretion of the Architect.

Galvanized or rustproof surface shall be left until last for painting.

Timber shall be primed before mixing on all faces.

All open grain timber shall be filled with an approved filler.

Nails or similar holes, open joints, cracks and other minor defects shall be puttied up after priming coat.

Timber glazing beads shall be given a priming coat before glazing.

Bottom and top edges of doors shall be given two coats of paint before hanging, including cupboard door at floor level.

Mixing and intermixing of paints on the floors of the building shall not be permitted.

Undercoats shall be tinted differently from he proceeding coat and each approved before the next coat is applied.

Except where otherwise specified or approved, all paint shall be applied with first quality brushware.

Paint shall be brushed on thoroughly and laid off so that no brush marks show on the finished face.

Samples of each colour and finish shall be prepared on selected surface for approval by Architect before painting commences. A sample shall not be less than 0.4 sqm

Where certain colours may require tinting and / or intermixing, this will be carried out with paints of the same manufacturer.

14.5 FINISHES

Opaque Finishes: Full Gloss Paint shall be approved quality, high gloss opaque alkyd paint. It shall be non-toxic, lead free, having resistance to abrasives, fair resistance to chemicals and solvents.

Full Gloss Enamel shall be an approved first quality, high gloss opaque alkyd enamel. It shall be non-toxic, lead-free, having high resistance to abrasives, fair resistance to chemicals and solvents

Semi Gloss acrylic paint shall be an approved semi-gloss opaque, water-borne, acrylic paint. It shall be non-toxic, lead-free, having very good resistance to abrasives, high resistance to chemicals and solvents.

Flat acrylic paint shall be approved flat, opaque water based acrylic paint. It shall be non-toxic, lead-free, having good resistance to abrasives, chemicals and solvents.

Clear Finish - Polyurethane finish shall be an approved two pack non-yellowing polyurethane matt/satin/gloss finish having a high resistance to abrasives.

Clear Stain finish shall be an approved oil rich stain containing a combination of natural oils, preservatives and waterproofing compounds.

Natural Timber Finish External shall be as for clear Stain Finish with the addition of permanent pigments.

Special waterproof coating shall be supplied and applied by a specialist Sub-Contractor or obtained from a specialist supplier and applied in accordance with the manufacturers instructions. These coatings shall carry a minimum 10 year guarantee.

14.6 APPLICATION OF FINISHES

Refer to Schedule of Paint Finishes. The Schedule of Paint Finishes takes precedence over the following:

14.6.1 CONCRETE BLOCKS, RENDER, FIBRE CEMENT.

High Gloss Acrylic :	3 coats
Semi Gloss Acrylic :	3 coats
Matt Latex (ceiling) :	3 coats

14.6.2 MILD STEEL WORK

High Gloss Enamel :	1 coat zinc chromate primer 1 coat enamel undercoat 2 coats high gloss enamel or 2 coats industrial enamel

14.6.3 GALVANISED STEEL WORK

High Gloss Enamel :	1 coat wash metal primer or 1 coat galvanised metal primer 1 coat enamel undercoat 2 coats high gloss enamel or 2 coats industrial enamel

14.6.4 TIMBERWORK, PLYWOOD

High Gloss Enamel :	1 coat wood primer 1 coat enamel undercoat 2 coats high gloss enamel or 2 coats industrial enamel
Semi-Gloss Enamel:	1 coat wood primer 1 coat enamel undercoat 2 coats semi-gloss enamel
Matt Timber Colour :	3 coats acrylic
Polyurethane Clear :	3 coats matt, semi gloss or gloss
Stain :	2 coats dark stain or 3 coats light stain

14.6.5 HARDBOARD, GIBRALTAR BOARD

Matt Latex Ceiling :	1 coat sealer 2 coats matt latex
Semi-Gloss Enamel:	1 coat sealer 2 coats semi-gloss enamel
Semi Gloss Acrylic :	1 coat sealer 2 coats semi-gloss acrylic

14.7 MAKING GOOD

Make good a.b.s “Preliminaries in addition by cracks appearing in paintwork before expiration of maintenance period shall be made good and the surface on which the cracks occur, repainted to the satisfaction of the Architect

15.0 GLASS

15.1 GENERALLY

All glazing to be executed in accordance with NZS 2258: 1969. All external glazing shall withstand 57 metres per second wind speed, cyclonic factor 1.15 Terrain Category 3, adjusted for height, terrain, etc.

The glass throughout to be of the best quality Australian or British Standards, approved manufacture, free from waves, air bubbles, blemishes and flaws of any description and of full weight and thickness specified.

Glass to be cut smooth with straight edge for the full size required by the various openings but maintaining clearances.
Snapping to reduce oversized dimensions, fares and the like not be permitted. Exposed edges of louvre blades shall be polished smooth.

Glass in external timber frames, unless otherwise specified, to be evenly back bedded in putty and fixed with beads having putty between back of same glass. Glass in internal timber framing shall be set in felt with felt between back of beads and glass. Glazing boards as shown in drawings.

Prior to glazing, unexpected bead faces to be given two coats of paint. All putty to be neatly trimmed and surplus removed.

On completion, all glass shall be cleaned and polished without scratching.

15.2 EXTERIOR GLAZING - As shown on drawings.

15.3 INTERIOR GLAZING

Fixed glazing: up to 0.6m2: 5mm float
up to 1.4m2: 6mm float

Louvre Blades: : 6mm float

Refer to drawings whether clear or obscure glass.

15.4 MIRRORS

Mirrors shall be 6mm thick polished plate glass with rounded and polished edges, double silvered and tropicalised including edges. Mirrors to have waterproof backing and mounted on 12mm marine ply.

15.5 SPECIAL TYPE GLASS

Refer to Schedule of Material and Finishes.

15.6 COMPLETION

Replace all defective, broken or cracked glass on completion. Remove all stains, paint, dirt, dust, etc.