TENDER DOCUMENTS

TENDER 07/2017 CIVIL WORKS FOR THE PROPOSED FIJI REVENUE & CUSTOMS SERVICE X-RAY SITE LAUTOKA

ENC:

- TENDER INVITATION LETTER
- NOTICE TO TENDERERS AND CONDITIONS OF TENDERING
- TENDER DRAWINGS
The Tenderer

Dear Sir/Madam

RE: TENDER 07/2017 INVITATION FOR CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA

We are pleased to invite your company to submit a Tender for the aforementioned project on a LUMP SUM CONTRACT basis with No Time Extensions. Please quote this sum in the Breakdown of Costs together with Requirements Compliance in the Fiji Revenue & Customs Service (FRCS) CIVIL WORKS FOR PROPOSED X-RAY SITE - Trade Summary document and take note of the particulars contained in the attached Notice to Tenderers and Conditions of Tendering.

The Tender closes on Friday 22 September 2017 at 12:00pm. Submissions should be delivered to:

The Revenue & Customs Tenders Board
Building 3, Level 3 Revenue and Customs Services Complex
Cnr Rt Sukuna Rd & Qn Elizabeth Drive, Nasese

The electronic version of the Submission must be submitted in CD or USB drive together with the hard copy. Tenders will be opened at 12:10pm. Bidders are welcome to be present during the opening.

The Tender Price shall be based on but not limited to the following in conjunction with the enclosed Notice to Tenderers and Conditions of Tendering:

1. The Lowest or any Tender shall not necessarily be accepted.
2. FRCS reserves the right to accept or reject any or all tender at our discretion.
3. All correspondences with FRCS shall be directed via email to tenders@frcs.org.fj.
4. The following documents are to be downloaded from the following web link http://www.frscs.org.fj/tenders-3/
   a. Tender Documents
   b. Trade Summary
   c. Tender Drawings
5. The Construction period shall be Ten (10) weeks maximum. Based on his/her own estimated timeframe, the Tenderer shall submit a Construction period not exceeding Ten (10) weeks;
   a. Project Duration shall be confirmed by Tenderer in their submitted tenders with wet days and other risks allowed in their Tender;
   b. Wet Days/Industrial Disputes/Inflation/Shortage of Labor and Materials will not entitle the contractor of Extension of Time or any additional cost;
   c. Six (6) Working Days per Week shall be allocated for onsite labour;
6. Any discrepancies in the Tender Documents shall be clarified during the Tender Period;
7. All Tenders shall be based on Site Inspection and Examination of existing site and all works deemed necessary to fully complete the works;
8. Building dimensions where necessary to be verified by the contractor to ensure correct quantities of materials are submitted in the tender price;
9. No variation will be entertained during the construction phase until and unless there are changes to the contract set documentation or any unforeseen circumstance that may arise. The Tender Validity period shall be 90 days.
10. Progress payments will be made 15 days upon approval of any progress claim. Progress payments for onsite unfixed materials will be made provided items have been paid for by the Contractor and items
are delivered at a reasonable time before their scheduled incorporation in the works;

11. 10% Retention shall be held until completion of the Defects Liability Period;
12. Defects Liability Period shall be One (1) Year upon practical completion. Refer Conditions of Contract for Details;
13. Contract Works Insurance shall be included in the Tender price;
14. Proof of Workers Compensation and Public Liability Cover are to be submitted;
15. The following are site rules to be adhered to:
   a. Work involving the use of tools or machinery that may cause excessive noise or vibration (work such as drilling, cutting, hammering, etc.) shall not be conducted during normal work hours;
   b. Water/Power shall be supplied by FRCS The Tenderer shall note that all power usage will be restricted to single phase power;
   c. Site Security shall be provided by the FRCS but the FRCS shall not be held responsible or liable for any damage to or theft of the Contractor’s property or injury to workers resulting from a breach of this security;
   d. The Contractor shall furnish all materials, tools, equipment, facilities and services as required for performing the required Scope of Works;
   e. Contractor to take full responsibility to avoid any damages to non-working area. FRCS to take responsibility to secure any furniture and other belonging which may affect the construction works.
16. FRCS decision to be Final in Disputes with advise from Architect.
17. Contractor to provide breakdown price based on the Breakdown Summary of Project Costs attached.
18. The documents forming the Tender shall be taken mutually explanatory of one another. In the case of any ambiguity or discrepancy in the documents, the Architect shall issue necessary clarification or instruction to the Contractor and the priority document shall be the Tender Drawings for Civil Works for the Proposed FRCS X-Ray Site Lautoka.

Should you require any clarification please email tenders@frcs.org.fj.

Sincerely

Revenue and Customs Tender Board
NOTICE TO TENDERERS AND CONDITIONS OF TENDERING

1 DOCUMENTS

1.1 Copies
The Architect shall furnish the Contractor with a counterpart of the signed contract documents, 1 sets of the Contract Documents, in addition to those required by the Authorities, and all calculations, information and documents required by the Authorities granting approvals.

Further copies of the Drawings and Specifications if requested by the Contractor will be in the manner described in the specifications. 1 signed set Contract Documents shall be retained by the FRCS.

1.2 Copyright
The copyright of the Drawings and Specifications is held by the Architect.

1.3 Return of Documents
All documents issued to the Contractor except the counterpart of the signed Contract Documents shall be returned to the Architect at the completion of the project.

1.4 Documents Kept on Site
The Contractor shall keep on the Site at least one copy of the Contract Documents, marked to show where superseded or modified.

1.5 Specification of Works and Bill of Quantities
The Tenderer shall issue a Specification of Works and Bill of Quantities that shall form part of the Contract Documents unless specifically excluded in the Specific Conditions.

1.6 Discrepancies
All apparent discrepancies in or between any of the contract documents, if found by either the Contractor or the Architect, the one shall forthwith notify the other party immediately. The Architect at the FRCS’s Representative consent shall issue a directive to resolve any discrepancy.

2 ADDITIONAL COPIES OF THE DRAWINGS FOR PURCHASE
These shall be provided at a cost to be determined by the Architect.

3 FORM OF CONTRACT
AS4000-1993 General Conditions of Contract will form part of contract.

4 TENDERERS TO INFORM THEMSELVES
Tenderers shall be deemed to have carefully examined all Documents relating to this Contract and, if they have doubt as to the interpretation or meaning of any portion of the Works indicated on the Drawings or
included in the Specifications or in the Agreement and Conditions of Building contract, they shall set forth the particulars thereof and submit the same in writing before Tender Closing Date.

5 SITE AND LOCAL INFORMATION
Tenderers shall be deemed to have informed themselves as far as practicable as to the risks, contingencies and other circumstances which could have an effect upon the cost of executing the Works as shown and specified and shall be deemed to have allowed for the same in their Tenders. Particular note to be taken of shipping schedules to meet material delivery targets.

6 PRICING
6.1 This is a FIXED PRICE TENDER, and shall not be subject to any price fluctuations or variations.
6.2 The Tenderer should price each item in a Specification of Works and Bills of Quantities that he feels may warrant a monetary sum. The BREAKDOWN OF PROJECT COST attached to the Tender Form must also be completed.
6.3 Works shown in the Drawings, and/or stated or implied in the Specification are deemed to be included in the Tender price whether specifically itemized in the Bill of Quantities or not.
6.4 The Tender price should be inclusive of any duty applicable for imported materials.

7 COMMENCEMENT AND COMPLETION TIME
Construction period shall be Ten (10) weeks maximum upon signing of Contract.

8 PRE-TENDER ENQUIRIES
Should the Tenderer consider that the Documents contain some unacceptable or unreasonable conditions, these should be brought to the attention of the Architect during the period within the Tender commencement date up until 2 days prior to the Tender Closing Date. Tenderers shall submit via email to the Architect via tenders@frcs.org.fj all discrepancies, errors, omissions and questions concerning the intent of the Drawings and/or Specifications.

9 TENDERS
The Tenders shall be submitted on the Tender Form & Summary, with all items filled out and on the following basis.

10 LODGEMENT OF TENDER
The Breakdown of Project Costs together with the following must be submitted:

a. Company Profile
b. Evidence of their experience, qualifications and financial condition and ability to carry out the terms of this Tender
c. Outline of proposed Construction Program and Management

d. FRCS and FNPF Compliance Certificates

11 NON-CONFORMING TENDERS

Any Tender which does not conform with any of the requirements of, which contains provisions not required by the document may be rejected. Please do not change the wording of the Tender Form.

12 COMPLIANCE & RESERVATIONS

The FRCS is not bound to accept the lowest or any Tender, nor will the FRCS be responsible for or pay any costs and expenses which may be incurred by a Tenderer in the preparation of the Tender.

Except as required by Law, no information relating to the examination, clarification and evaluation of Tenders and recommendations concerning awards will be communicated after the opening of Tenders to any persons not officially concerned with these procedures.

Tenders received after the limit set of the receipt of Tenders will be returned unopened.

Any form of approaches to FRCS or Consultants or enervating by a Tenderer during the Tender Period would be ground for disqualification.

13 CLOSING DATE

The Tender Closing Date shall be Friday 22 September 2017 at 12:00pm. The hard copy submission must be delivered to:

   FRCS Tender Board  
   Building 3 Level 3, Revenue & Customs Services Complex  
   Cnr of Ratu Sukuna Rd & Qn Elizabeth Drive, Nasese, Suva

Electronic submissions must be submitted in CD or USB drive and included with the hard copy submission.

14 OTHERS

The Contactor is to provide samples of products that are to be used on the project during the site meetings with FRCS & Architect.
SCOPE OF WORKS

1. Demolition of existing timber structure/building on site, and demolition of pipe fencing as indicated on plan.
2. Excavate 200mm top soil.
3. Excavate soil and lay rock line drain and make good existing.
4. Build existing inspection chamber and cover - refer to details as in plan.
5. Fill with specified fill material (refer to structural drawings) to 200kpa proved test till reach 100.500 levels.
6. Construct perimeter fence and motor operated gate as indicated on plan.
7. Lay concrete slab - refer to structural drawings.
8. Paint markings to be done and install track (guide rail) on slab as in plan. Please note: Track (Guide Rail) to be installed after the mobile x-ray is moved into site.
9. Install security pole - refer to details on electrical plan and sheet S11.
10. Install CCTV security system.
TECHNICAL CONTRACT CONDITIONS

1 DEFINITIONS

‘FRCS’ shall mean FIJI REVENUE and CUSTOMS SERVICE
‘FRCSs Representative’ shall mean the PROJECT OFFICER assigned by the FRCS
‘Project Manager’ shall mean MINISTRY OF INFRASTRUCTRE AND TRANSPORT
‘Engineer’ shall mean MINISTRY OF INFRASTRUCTRE AND TRANSPORT
‘Documents’ shall mean, Architectural, Structural, Civil, Site works and Services Drawings, General Conditions of Contract, this document containing Tender and Contract Conditions and Specifications.
‘Works’ shall mean all the work contained in this Contract between the FRCS and the Contractor as specified in the enclosed Drawings and Specifications and including such extra work be directed to be executed in accordance with the Conditions.
‘Builder’ or ‘Contractor’ shall mean the Building Contractor whose Tender has been accepted by the FRCS and includes the Contractors agents, legal personal representative or successors.
‘Approved’ shall mean by the Project Manager/Engineer in writing unless otherwise specified.

2 EXTENT OF WORK

The work shall include:

a. All work shown in Structural Drawings and as specified in this Specification and including all details and works to satisfactorily complete the project.
b. All installations and work by Nominated Sub-Contractors and Suppliers.
c. Contractor’s attendance as specialist or services Sub-Contractors MoIT and other Statutory Bodies.

3 INTENT

The intent of the Contract is to complete the works as outlined in Clause 2 in its entirety. Where contraction or item work is to be obviously inferred, or is usual, proper and necessary in the class of work generalized in the Documents, the same is to be included, notwithstanding that such construction or such necessary item is not specifically mentioned in this Specification shown on the Drawings.

4 AGREEMENT AND CONDITION OF CONTRACT

4.1 The Contract shall be carried out in accordance with the following Documents which shall form part of the Contract.
   • The Conditions of Tendering and Special Contract Conditions
   • The Drawings
   • The Specifications of Works and Bill of Quantities

4.2 In the event of discrepancy between these Documents the order of precedence shall be in accordance with the order given in 4.1.

4.3 This clause shall not affect the obligation of the Contractor to refer any discrepancy between the Documents to the Architect and the Architects right to issue instruction in regard therefore of the General Conditions of Contract.
5 DRAWING TO INFORM THEMSELVES

The Contractor shall be deemed to have visited and inspected the site surroundings and to have become fully acquainted with all aspects of the site and locality, and with all other matters relevant to the method and cost of construction of the Works. They shall also be fully acquainted with local conditions of labour, supply of materials, excise duties, local and statutory holidays, etc., prior to the submission of Tender. No extensions for time due to local or statutory holidays falling within the Contract Period shall be entertained.

6 CONTRACT DRAWINGS AND DOCUMENTS

The Drawings and Specifications hereinafter shall form part of the Contract Document and shall be read in conjunction with each other and with the Specifications. The Drawings shall be held to determine the general character of the work as well as the details of the same. Parts not detailed and/or specified shall be constructed in accordance with the best standard practice of work of class generalized, so as to complete logically the parts they compose. Where it is obvious that a Drawing and/or Specification reference illustrates only part of a given work or a number items, the remainder shall be deemed repetitious be so constructed.

7 INSURANCES

The Contractor shall observe, Ordinances, By-Laws and with all requirements of any Authority having jurisdiction over any aspect of the Works as shall be in force during the currency of the Contract, and the Contractor shall obtain all licenses, consents and permits of these Authorities and shall make all arrangements and execute all work in accordance with their latest regulations and requirements. He shall pay fees and bear all costs connected therewith.

8 RESPONSIBILITY FOR SUB-CONTRACTORS

If a part of the Work has been sub-contracted, the Contractor has been held responsible of all work, materials and fittings comprised in any sub-contract, and for their care, maintenance and protection. He shall be required to take full responsibility for the proper execution of such for the full period of his legal responsibility in connection with his Contract.

10 PROGRAM OF WORK / CRITICAL PATH / PROGRESS SCHEDULE

10.1 Within two weeks after the acceptance of his Tender the Contractor shall submit to the Architect for approval a program showing the order of procedure and methods in which he proposes to carry out the works with the Critical Path, that is, those elements as being able to be affected by inclement, shown clearly. The submission to and approval by the Architect of such a program or the furnishings of such further particulars as may be required shall not relieve the Contractor or any of his duties or responsibilities under the Contract.
10.2 The Contractor shall maintain and amend the Works program as may be necessary from time and issue copies to the Architect and have a current copy available on site at all times for inspection by anyone concerned.

10.3 The Program must include all Nominated Sub-Contractors work and their requirements and shall show the date for commencement and completion of all Sections of Work included in the Contract. The progress of the Works shall be regularly recorded by the Contractor on a copy of the above mentioned schedule, which shall be kept on the site. The Contractor is responsible for all Nominated Sub-Contractors adhering strictly to the program.

10.4 The Contractor and the Architect, if either requests, shall jointly prepare a schedule, subject to review from time to time in accordance with the progress of the work, fixing the dates by which the various detail Drawings will be required and the Architect shall furnish Drawings in accordance with such dates.

10.5 The Contractor shall submit to the Architect together with the Progress Schedule, a list of items requiring selection, detailing instructions and directions, etc. by the Architect, together with the corresponding dates by which the selection, details, instructions and directions, etc. by the Architect unless the content of the above paragraph is observed by the Contractor. The program shall clearly indicate all holidays falling within the Contract Period.

11 DELAYS / EXTENSIONS OF TIME

11.1 Should any delay to the progress of the work – for whatever reason – become apparent, the Contractor shall inform the Architect/project officer the nature and possible extent of the delay immediately. Should a delay occur beyond the control of the Contractor, application must be made immediately at the time of the delay for an extension of the Contract Period. Extensions not claimed a.b.s. shall not be recognized. No claims after 2 weeks of the event shall be considered.

11.2 Should it become apparent that the progress of the works is to be delayed, the date of Practical Completion stated in the Appendix to the Form of Contract or beyond the adjusted date for completion fixed due to granted extensions of time a.b.s., then the Contractor shall be expected to carry out overtime / weekend work at his own expense, in order to expedite completion.

12 UNACCEPTABLE DELAYS & PENALTY

For unacceptable delay of work, the FRCS shall charge the Contractor FJ$1000 per day for every day additional to the defined timeline as specified in 10.

13 NOMINATED SUB-CONTRACTORS & SUPPLIERS

13.1 The Contractor is to ensure, prior to entering into Contracts with Nominated Sub-Contractors, that each nominated Sub-Contractor is able to deliver and / or fix the specified items and carry out the specified work without causing any delay to the Works of any other Sub-Contractor and / or the Contractor.

13.2 The Contractor is expected to honour all payments due to the Nominated Sub-Contractor within 14 days of receipt of payments for their works included in Payment Certificate.

14 ACCESS TO SITE

Contractor shall provide access to the FRCS or his representative(s).
15 SOURCE OF MATERIALS

Materials for incorporation in the works and equipment imported for use on the Works: preference shall be given to items obtained from those which originate in Fiji subject to qualify and standards specified and guarantees offered by manufacturers and suppliers.

16 CUSTOMS DUTIES

All duties, where applicable, arising out of the Contract shall be included in the Tender.

17 CONTINGENCY SUM

The Lump Sum Price includes the amount as directed in writing by the Architect. If not used, or in part only, then the amount not spent shall be deducted from the Contract Sum. Any excess expenditure will be added to the Contract Sum.

18 RETENTION PERCENTAGES

Retention shall be to the order of 10% (ten per cent).

19 DEFECTS LIABILITY PERIOD

At the commencement of the defects liability period, a list of un-completed items shall be given to the Contractor’s direction, shall complete the outstanding items within 4 calendar weeks of the commencement of the defects liability period. Defects Liability Period is one (1) year. If the items are not completed within the period, the defects liability period and maintenance period shall be extended by the amount of excess time taken to complete them. Other lists of defects shall be issued during the defects liability period and must be rectified and completed to the approval of the Architect before Retention Release and Final Payment.

20 GOVERNING LAW

The laws of the Republic of Fiji shall be the proper law of this Contract.
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FOR
CIVIL WORKS FOR THE PROPOSED FRCS
X-RAY SITE LAUTOKA
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SECTION 1 – GENERAL REQUIREMENTS & PROVISIONS

1.0 THE REQUIREMENT
It is required that there be constructed and completed in accordance with the Conditions of Contract, this Specification and the Drawings, the works as described herein for the Ministry of Infrastructure and Transport. This Project is for the general purpose of carrying out all civil works to facilitate and provide for the infrastructure development area on the site for the proposed CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA.

1.1 Mobilization
This requirement is for the Contractor to provide and establish plants, equipment, facilities and personnel upon the site for the execution of the prescribed Contract work. The work covered in this section is included in Items 1.2 to 2.3 inclusive.

1.1.2 Maintenance of Contactor’s Establishment
This requirement is for the Contractor to maintain its establishment on the site and is covered, but not limited to, those in items 1.6, 1.7, 1.8 and 1.16.

1.1.3 Demobilization
This requirement is for the Contractor to demobilize the worksite in accordance with the items covered, but not limited, to those in Items 1.6 – 1.11 inclusive.

1.1.4 Performance Guarantee
This requirement is for the Contractor to provide and maintain the Performance Guarantee for the period stipulated in accordance with the items covered in the whole contract.

1.1.5 Insurance
This requirement is for the Contractor to provide all Insurance cover as required by the Contract.

1.1.6 Setting Out
This requirement is for the Contractor to provide the setting out as required in the Drawings and these Specifications.

1.1.7 Quality Control and Testing
This requirement is for the Contractor to carry out all necessary process for quality control, testing and supervision throughout the whole contract works.

1.1.8 Maintenance of Traffic ways and Access
This requirement for the contractor to include all necessary process for maintaining the traffic access roads during this Contract.

1.1.9 Locations of Services and Local Liaison
This requirement is for the contractor to include all liaison, consultation and coordinating with the relevant Authorities regarding the relocation of services where required.
1.1.10 As-Built Drawings
This requirement is for the Contractor to undertake and complete all as-built drawings record and document the actual work done and to record any change made and approved by the Project Architect/Officer during the construction work. A Detailed Survey of the finished works in contract form will be required from the Contractor as part of this requirement.

1.1.11 Traffic Control
This requirement is for the Contractor to cover all traffic management requirements as required by the relevant authorities e.g. Local Rural Authority.

1.2 DESCRIPTION OF WORKS
The principal items of work included in this Contract and required to be completed by the Contractor are:
Cutting and Filling for the future development of the CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA.
- Land profile formation, strengthening and Retention
- Provision of Site Signage as noted on the Drawings;
- Storm water Drainage/Culverts
- Access Road/Footpaths

This Project involves site civil earth works including earthworks retention, formation leveling and site drainage works.

1.3 SITE GEOLOGY AND CONSTRUCTION MATERIALS

1.3.1 Contractor’s Responsibility
It will be the Contractor’s responsibility to determine the availability of sufficient quantities of construction material required for the Works. The suitability of any material for its proposed use shall be subject to approval by the Project Manager/Officer.

1.3.2 Royalties/Permits
The Contractors shall be responsible for the payment for any royalties, fees or charges for materials taken from any sources. The Contractor shall also pay for all costs for obtaining permit or providing additional EIO (or Similar) report by relevant Authority for material mining for the purpose of filling or construction work as required in the Contract or other documents.

1.3.3 Suitability of Material
At least twenty-eight (28) days prior to utilizing any source, the Contractor shall notify the Project Architect/Officer of its location, the type and quantity of material available and its intension regarding its use so that the suitability of the material may be determined. The Contractor shall allow the Project Officer to sample the source as is necessary to determine the suitability of the material. At any time during the progress of the work, the Project Manager/Officer may take further sample from the source and should further testing indicate that the material is unsatisfactory approval for use of the source will be withdrawn. The Project Manager/Officer’s
approval to the use of the source of material shall not relieve the contractor in any way of its obligations to ensure that the material incorporated into the Works meet Contract requirement and minimum standards.

1.3.4 Material from Natural Deposits
In obtaining material from Natural Deposits, the Contractor shall take all necessary steps to protect the existing nearby properties from inconvenience, dust, inquiry or loss and shall indemnify the FRCS/FRCS against any claims arising from the use of such deposits. The Contractor shall be responsible for the immediate repair or replacement of all damaged fences, walls and other improvements including buildings and stock. All necessary steps shall be taken to prevent erosion and fire due to the Contractor’s activities. All site areas shall be cleaned up and left in a neat and tidy condition in accordance with the relevant Clauses of the Specification.

1.3.5 Costs
The cost of all work involved in developing a source of construction material of constructing and maintaining haul roads, of winning and hauling the materials to site, any necessary reinstatement of the haul roads or borrow area and of any necessary processing shall be deemed to be included and allowed for within the price tendered.

1.4 COMMENCEMENT, EXECUTION AND COMPLETION OF WORKS

1.4.1 Start Date
The start date shall be the date the Award Letter is given by FRCS Tender Board and is accepted by the Contractor whilst project execution date as agreed by both parties. Form of Agreement is to follow.

1.4.2 Completion
The Contractor shall complete the entire Works within the time specified in the Contract Data. Where concrete is included it shall be placed at least 28 days prior to the completion tie required.

1.5 LABOUR, MATERIAL AND PROGRESS REPORTS

1.5.1 Reports on Labour and Plan
At the end of each shift of work, the Contractor shall prepare a report in detail showing the supervisory staff and number of the several classes/trades of labor employed by the Contractor on the Site during the shift and such information as the Project Manager/Officer may require. At the end of each week, the Contractor shall submit a brief summary weekly report on the basis of the above-mentioned daily reports to the Project Manager/Officer.

1.5.2 Weekly Progress Report
The Contractor shall prepare a Weekly Progress Report at the close of each week in a form approved by the Project Manager/Officer. The Report shall show the volume of Works completed, materials actually used, materials in storage onsite and offsite, and the cumulative results of all operations completed or in progress. It shall be summarized in terms of the percentage of Project completion.
The Report is to include photographs and other pictorial or graphical enclosures necessary to convey progress information. The Report shall also include mention of the occurrence of any event or condition that might delay or prevent completion of the Project in accordance with the approved construction program.

1.6 CAMPS AND HOUSING

The Contractor shall provide and maintain such facilities as are necessary for the accommodation and messing of its workers/employees.

The Contractor shall make its own arrangements to construct accommodation and messing facilities for employees. The location shall be appropriate to the intended use thereof and shall be subject to the approval of the Project Manager/Officer.

Not less than thirty (30) days before commencing work on any feature of housing or camp construction, the Contractor shall submit drawings and specifications of the work proposed to the Project Manager/Officer for approval and such work shall not be commenced without prior approval.

The Contractor shall be required to provide effective water supply and any other services to the camp and work areas and provide reticulation system for these areas unless otherwise arranged and agreed to by the FRCS.

The Contractor shall be required to provide effective approved sewage disposal systems to its camp and work areas.

All garbage and refuse in the Contractor’s camp and works areas shall be collected by the Contractor at regular intervals and shall be disposed of as approved by the Project Manager/Officer.

The FRCS will not be responsible for damage to and interference with Contractor’s camps and housing due to any operation under the Contract or to inundation or to floods or to any other cause.

Upon completion of the permanent work, all housing, camp buildings and camp construction erected by the Contractor shall be dismantled and remove from the site or otherwise disposed of, all services disconnected, all pits and other excavation shall be neatly filled in, all overhead lines shall be removed and the housing and camp areas left in a clean and tidy condition.

Additional payment will not be made to the Contractor for the provision, operation or maintenance of housing and camps and other facilities provided by the Contractor as set out in this Clause, and the cost of such work shall be included and allowed for with the Lump Sum price tendered.
1.7 CONTRACTOR’S CONSTRUCTION PLANT AND EQUIPMENT
Within thirty (30) days of the Project Manager/Officer’s Order to Commence work, the Contractor shall advise the Project Manager/Officer of any amendments to the schedule of construction plant and equipment submitted in accordance with Instruction to Bidders. During the period of the Contract, the Contractor shall maintain, at the Site, plant and equipment in accordance with this schedule amended as necessary by alternative and additional items approved by the Project Manager/Officer.

1.8 APPROVAL OF CONTRACTOR’S BUILDING, PLANT, EQUIPMENT AND PROCEDURES
The Project Manager/Officer is to be notified at least ten (10) days before commencing construction or erection of any Temporary Works the Contractor shall submit to the Project Manager/Officer for approval, drawings and specification of the proposed work and shall not commence work without prior approval.

Approval by the Project Manager/Officer of the Contractor’s plant and equipment or of any construction procedures shall not operate to waive or modify the Contractor’s responsibilities with respect to any provision or requirement of this Contract.

Where this Specification prescribes specific types of equipment to be used or specific procedures to be followed, the Contractor may submit alternative proposals to the Project Manager/Officer for approval. If and when it has been demonstrated that equivalent results will be obtained by the use of such alternatives, the Project Manager/Officer may approve this accordingly.

1.9 CONTRACTOR’S DEPOT, CONSTRUCTION FACILITIES AND SERVICES
The Contractor shall make its own arrangements for the purchase or lease of area required or use as works area. The location of area to be used as works area shall be subject to the approval of the Project Manager/Officer. The FRCS shall accept no liability in connection with the arranging or use of such areas.

Unless otherwise approved or directed by the Project Manager/Officer, the Contractor shall confine all workshop, storage and similar facilities to the area approved for use as a works area. The Contractor shall construct temporary fences and gates of an approved type within the boundaries of the works areas.

The Contractor shall construct, operate and maintain at the site of the Works temporary toilet facilities complete with septic tanks, absorption trenches or other sewerage disposal installation. Adequate water-borne water closets, and urinals and hand basins shall be provided for all personnel.

The temporary toilet facilities shall meet the requirements of the relevant Authority. The location of these facilities and their construction shall be as approved by the Project Manager/Officer.

The cost of providing, operating and maintaining these toilet temporary facilities and sewerage installations shall be included in the cost of the various items of the work.
The Contractor may erect or more notice boards on the site provided they are constructed of durable materials. The number, wording, style and location of the notice boards and method of support and fixing shall be as approved by the Project Manager/Officer.

1.10 ELECTRIC POWER AND WATER
The Contractor will be required to make its own arrangements for all power and water for construction and domestic use in the camp and work area.

All electrical installation in buildings, camps and on the works area (including earth and protection) shall be of good quality and shall comply with the required standards for Permanent and Temporary Works and shall be to the approval of the Project Manager/Officer.

All motors shall be provided with capacitors to provide the necessary power factor correction. In particular, attention must be paid to safety in wet and constricted locations. Extra low voltage (less than 50 volts) shall be used for portable hand lamps and temporary lighting.

The Contractor will be solely responsible for the safety of all the electrical facilities within the work areas.

No overhead transmission shall be dismantled or removed without the agreement of the Project Manager/Officer.

On completion of the Works, the Contractor shall dismantle and remove or otherwise dispose of all electrical installations except those which the FRCS has elected to retain and the entire cost of dismantling and removal shall be included in the unit prices tendered for various items of work.

1.11 SAFETY

1.11.1 General
In the performance of the Works, the Contractor shall exercise every reasonable precaution to protect, from injury, persons or property. It shall erect and maintain all necessary temporary fencing, barricades, barriers, multilingual signs and lights and provide fire alarm, fire extinguishing and firefighting services at strategic points on the Site and shall adopt and enforce such rules and regulations as may be necessary, desirable or proper to safeguard the public, all persons engaged in the work and its supervision.

1.11.2 Safety Officer
The Contractor shall appoint a Safety Officer and hold regularly scheduled safety meeting with the Project Manager/Officer and with its own supervisors and foremen. Safety measures shall include but shall not be limited to the following:

A. Temporary Fencing
The Contractor shall erect, maintain and remove suitable and approved temporary fencing to enclose such area of the Works and all areas of land occupied by the Contractor within the site as
may be necessary to implement its obligations under the Conditions of Contract, to the satisfaction of the Project Manager/Officer.

B. Lighting
Without limiting the generality of the Condition of Contract, the Contractor shall provide sufficient lighting to ensure that, in all places where work is in progress:
   i. safe working conditions are provided both for the Contractor’s personnel and for personnel of the Project Manager/Officer.
   ii. The Works can be constructed in compliance with the Contract; and
   iii. A complete inspection of all works in progress can be made by the staff of the Project Manager/Officer.

C. Work in the Vicinity of Electrical Equipment
In the interest of safety and security, the Contractor shall complete the erection of any safety fencing around electrical and mechanical apparatus by the time that the said apparatus is connected to any electrical supply.

1.11.3 Accidents
The Contractor shall:
   i. Promptly report to the Project Manager/Officer in the form to be prescribed, all accidents involving deaths or serious injury to staff or workmen; and
   ii. Furnish monthly report of all accidents to staff or workmen involving loss of time, giving such information as may be prescribed by the Project Manager/Officer.

1.12 FIRST AID AND MEDICAL FACILITIES
The Contractor shall provide first-aid posts at the main working areas all to the approved of the Project Manager/Officer.

Direct payment will not be made to the Contractor for any costs arising from this Clause. Such costs shall be included in the lump sum price tendered.

1.13 DAYS OF WORK AND WORKING HOURS
The Contractor shall advise the Project Manager/Officer at the time of the Tendering of the normal working hours and shift times during which it proposes to carry out the work, which working hours and shift times shall be subjected to the approval of the Project Manager/Officer. Work on the Site will normally not be permitted on Sundays.

The Contractor may carry out work outside of the approved working periods if it is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Project Manager/Officer.

1.14 INSURANCE
The Works shall continue to be insured in accordance with the Conditions of Contract. No additional payments will be made.
1.15 MATERIALS TO BE FURNISHED BY THE CONTRACTOR

The Contractor shall furnish all materials required for the carrying out of the Works. All materials that will become part of the completed Works shall be new and shall conform to this Specification. Where the requirements for any materials are not stated in this Specification, the materials shall conform to the appropriate and most recent international or national specification as the Project Manager/Officer may approve.

Separate items for furnishing any materials required to be furnished by the Contractor; the costs of furnishing, hauling, storing and handling such materials shall be included and allowed for within the Lump Sum price tendered.

The Contractor shall make diligent effort to produce the specified materials but where, because of priorities or other causes, materials required by the Specification are not available, substitute materials may be used but not without prior written approval of the FRCS/Project Manager/Officer, and the Officer’s determination as to whether substitution shall be permitted and as to what substitute materials may be used shall be final, binding and conclusive. Any difference in costs arising from such substitution shall be allowed for and adjusted between the parties and terms of such adjustment shall be recorded in writing and signed for, and on behalf of the FRCS and the Contractor.

Materials and equipment furnished by the Contractor, which will become part of the completed Works, shall be subject to inspection, examination and test as provided in the Contract. To allow sufficient time to provide for inspection, examination and testing, the Contractor shall submit to the Project Manager/Officer, at the time of issue, copies in duplicate of all orders, including drawings and other pertinent information, covering the materials, and equipment to be inspected, examined and tested or shall submit other evidence in the event of such orders being issued verbally or by letter. The inspection, examination and testing thereof shall in no way relieve the Contractor of the responsibility for furnishing materials and equipment meeting the requirements of this Specification.

1.16 ESTABLISHMENT

Establishment shall be deemed to include the cost of provision, erection, maintenance and removal of camp accommodation, offices, buildings, all required construction facilities, provision and mobilization of construction plant and equipment required for the execution of the Works and clean-up of the Site on completion.

Construction facilities on which previous payments have been made shall be maintained in good order and shall not be demolished, removed from the Site or otherwise disposed of without the prior approval of the Project Manager/Officer.

Payment for Establishment will be deemed to be included in and allowed for within the Lump Sum price tendered.
1.17 DRAWINGS
The Drawings which form part of these Contract Documents shall form the complete set of construction details to be issued to the Contractor by the FRCS. Additional drawings showing further details will not be supplied to the Contractor, except as required by the Conditions of Contract. Additional copies of the Drawings, in addition to the number of copies to be supplied under this Contract, will be made available to the Contractor by the Project Manager at no cost.

The Contractor shall not derive construction dimensions by scaling the Drawings. The Contractor shall check all measurement and set out information which may have been caused by the movement of permanent marks or any other cause, the Contractor shall advise the Project Manager/Officer immediately and await clarification of the matter.

Where the Contractor is required to submit drawings to the Project Manager/Officer for approval it shall conform to the following requirements:
(a) All drawings shall be of ISO ‘A’ series sheet size. The A1 sheet size is preferred.
(b) The Contractor shall submit one transparency on plastic film with adequate contrast between line work to enable good definition to be obtained for microfilmed records and one print each drawing.
(c) Provision shall be made in the title block of all drawings for the inclusion of the FRCS’s drawing record number in a space 12mm high by 60mm long.

1.18 STANDARDS
Australian Standards, published by the Standards Association of Australia, are referred to throughout the Specification and shall be read as part of the Specification except where conflict arises in which case this Specification shall apply. Australian Standards are identified by their reference number only and for the purpose of the Contract shall be the Standard which are current fourteen (14) days prior to tenders closing.

In some instances, where Australian Standards are not available, the Standards published by the British Standards Institute or the American Society for Testing Materials (ASTM) are referenced. They shall be read in the same manner as the Australian Standard.

1.19 EXISTING WATER MAIN
A water main follows the general alignment of the existing road and at some locations is within or close to the area of the Works. The Contractor shall determine the location of the water main in sufficient time to enable it to be relocated, if necessary, prior to the commencement of work in any area.

The Contractor shall inform the Project Manager/Officer of the location of the water main in any area at least three weeks in advance of its intention to undertake works in the area and shall advise the Project Manager/Officer of its requirement for any section of the water main to be relocated.

The Contractor will be responsible for liaison with Water Authority of Fiji to make arrangements for the relocation of any sections of the water main needed to be relocated. It shall be responsible for all costs associated with the relocation of the water main.
The Contractor shall be responsible for all costs associated with repairs and reinstatement of any sections of the water main damaged by its actions or the actions of its employees.

1.20 ROADS AFFECTED BY THE CONTRACTOR ACTIVITIES
The Contractor shall maintain all roads affected by its activities including the roads to pits, quarries, camps and the like is a standard similar to or better than that pertaining at the commencement of the Works.

Separate payment will not be made for complying with the requirements of this Clause and all costs shall be included and allowed for within the price tendered for the Lump Sum.

1.21 MAINTENANCE OF ADJACENT ROADS
The Contractor shall undertake road maintenance on roads that are not affected by its activities in close proximity to the site of the Works when so directed by the Project Manager/Officer.

Payment for such maintenance work shall be allowed for in the Lump Sum price.

1.22 SURVEY MARKS
The Contractor shall as far as practicable, protect all survey marks from damage and shall install recovery marks as necessary to enable the survey marks that will be affected by the Works to be relocated. Missing survey marks or those damaged by any cause shall be replaced as necessary by the Contract at its expense. Contractor to engage surveyor to verify and peg clearly all boundary pegs.

1.23 DAY WORKS
Day works for the provision of labour, materials and plant will be paid for at the rates provided in the Schedule 1 of the Schedules of Particular Information.

1.24 BASIS OF PAYMENT
The cost of Mobilization and Demobilization is deemed to have been allowed for in the Lump Sum price in the Bill of Quantities.

Payment for mobilization and demobilization shall be made when the Contractor has established itself upon the site to the satisfaction of the Project Manager/Officer. Contractor to engage a registered surveyor to verify and peg clearly all boundary pegs.

SECTION 2 – EXCAVATION AND BACKFILLING

2.1 GENERAL
a) Excavation and backfilling to underside of footings shall conform with this Specification and the Contract Documents.

b) All discrepancies between Contract Documents shall be referred to the Project Engineer for decision before proceeding with the work.

c) All workmanship, materials, and testing shall conform to the following Code and
Specification, except where varied by this Specification.

d) Responsibility for the correctness of all works related to levels, materials supplied to site, and final compaction shall rest entirely with the Contractor.

2.2 INSPECTION BY THE ENGINEER

The Contractor shall provide the Project Engineer with 48 hours’ notice to inspect the following stages of work:

a) Complete temporary structures for safety purposes
b) Setting out of the works
c) Excavations before backfilling commences
d) Compaction of ground prior to placing concrete
e) Completed excavation before construction commences.

2.3 SET OUT

A Bench Mark for levels shall be established by the Contractor.

The Contractor shall transfer all necessary levels from this Bench mark to the various points of construction with the work area, and shall protect the corner location pegs, or their offsets, from disturbance.

The Contractor shall engage a Licensed Surveyor to certify that the works have been set out in the correct position. All costs associated with such engagement and certification shall be borne by the Contractor.

The Contractor shall be responsible for making the locations and protecting from damage, caused by himself its sub-contractors, agents and employees, all services on the site of the Works. The Contractor shall be responsible for making alterations or additions to the existing services unless otherwise provided for in the Contract.

In the event of damage to or unauthorized opening up of any services, the Contractor shall immediately notify the Project Manager/Officer and request instructions. When as a result of the Contractor’s operation a service line is damaged, which is indicated on the drawings, or evident on the site, or has been pointed out by the Officer-in Charge of the service, the Contractor shall be liable for the cost of any necessary repairs.

The Contractor shall set out all the works to be constructed under this contract accurately to ensure that the work is constructed to the lines and level specified.

No changes shall be made to the locations of any components of the dimensions shown on the Drawings unless otherwise approved by the Project Engineer.
2.4 EXCAVATION
The works shall be excavated to the levels and dimensions shown on the Drawings or to such other levels and dimensions as the Project Engineer may direct.

This specification makes no provision for blasting. Should blasting become necessary, the Project Engineer is to be notified immediately.

Suitable excavated materials shall be utilized in backfills subject to Project Engineer’s approval.

Unsuitable or excess excavated material shall be disposed of at waste locations. Contractor to allow for carting away all unsuitable or excess excavated materials within a radius of ten (10) km from the site.

Pockets of unsuitable materials within the limits of excavation shall be removed and wasted. The method of excavation shall not weaken surrounding areas nor damage adjacent structures or parts thereof. Structures and utilities adjacent to excavation shall be protected and supported to prevent settlement.

Ingress of water into excavations shall be prevented where possible and all water in excavation shall be controlled and removed. Discharge from pumps shall be drained at locations as directed. Spring or seepage encountered shall be immediately controlled as directed by the Project Engineer.

In all excavations all rocks, stones, organic matter or debris exposed shall be removed to a depth of at least 200mm below the bottom of the excavation. Areas being excavated and areas to be backfilled shall be maintained in a clean free water, leaves, brush, sticks, trash and other debris.

Excavation surfaces which are to support pavements, buildings or structures shall be compacted to 95% modified A.A.S.H.O. for a depth of at least 200mm and kept free from traffic until the pavement etc. are built.

Should the moisture content vary significantly from optimum moisture content such as to prevent compaction to the specified density the top 200mm shall be scarified and the moisture content adjusted as necessary to achieve the proper compaction.

Depressions appearing during compaction shall be excavated down to a level directed by the Project Engineer filled and re-compacted.

2.5 MAINTAINING EXCAVATION
The Contractor shall allow for timber, planking, strutting and dewatering where necessary to maintain all excavation during the required period.

All temporary works provisions are to be removed when no longer required.
2.6 BACKFILL MATERIALS
All compacted fill shall comply with the following:
Materials shall be selected from an approved source, shall be free of vegetable matter and bails of clay, and shall comply with the following requirements:
  a) CBR value after 4 days soaking not less than 25 when compacted to at least 95% maximum dry density as determined by AS 1289 Test No. E1.1.
  b) Maximum linear shrinkage 6%.

Grading

<table>
<thead>
<tr>
<th>SIEVE SIZE (mm)</th>
<th>% BY WEIGHT PASSING</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.5</td>
<td>100</td>
</tr>
<tr>
<td>19.00</td>
<td>60-100</td>
</tr>
<tr>
<td>9.5</td>
<td>40-80</td>
</tr>
<tr>
<td>4.75</td>
<td>30-60</td>
</tr>
<tr>
<td>2.36</td>
<td>20-45</td>
</tr>
<tr>
<td>0.425</td>
<td>15-30</td>
</tr>
<tr>
<td>0.075</td>
<td>3-15</td>
</tr>
</tbody>
</table>

The fraction passing 75-micron sieve shall not exceed 2/3 that passing the 425-micron sieve. The fraction retained on the 2.36 sieve shall consist of hard durable particles or fragments of stone, gravel or sand and shall not include any material that breaks when alternately wetted and dried.

The fraction passing the 425-micron sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 10.

Compacted fill underground slabs shall be an approved granular material, with a maximum particle size no larger than the AS 13.2mm sieve.

Drainage layers as identified on the Drawings shall consist of single size aggregate, ranging in size from 5mm to 10mm aggregates.

2.7 PLACING AND COMPACTION
Backfill and select backfill shall be placed in horizontal uniform layers not exceeding 150mm in thickness before compaction.

The material shall be placed in such a manner as to avoid the segregation of particle sizes.

Backfill around constructed foundations and structures shall be placed and compacted equally along all sides of the structures to prevent unequal loadings.

Selected backfill and sub-base materials shall be compacted to not less than 95% max. dry density (modified method) unless otherwise noted on drawings.
The moisture content of material placed shall be within the limits of optimum moisture content. Optimum moisture content shall be determined in accordance with AS 1289 E5.1.

Materials which cannot be compacted to the required density because of high moisture content shall not be used without prior aeration and drying. Where compaction trials show that a material cannot be sufficiently dried out to a moisture content with such a range as to achieve the required density and, in the opinion of the Engineer, alternative methods are not readily available, such soils shall be compacted to a dry density equal to at least the maximum dry density at field moisture content as determined in accordance with AS 1289 Test E2.1.

The field moisture content shall be determined from a representative sample taken at a depth of at least 300mm from the surface of the material.

Operation shall be planned so that such materials are placed in the lower layers of fills and that such materials are not placed within 600mm of the underside of sub-base materials or beneath or adjacent to buildings and structures.

Unless otherwise shown on drawings or directed by the Project Manager, cohesion less material shall be compacted such that the density index is not less than 75%.

Tests for specified compaction shall be carried out in accordance with the following:

a) Maximum density at optimum moisture content shall be determined in accordance with AS 1289.E2.1.

b) In-place density shall be determined in accordance with AS 1289.E5.1.

c) The density index shall be determined in accordance with AS 1289.E6.1.

d) Where structural backfill materials do not meet the requirements of this specification, they shall be reworked, watered as necessary and re-compacted to conform or be removed and replaced as directed by the Project Manager/Officer.

e) Structural backfill required against substructures and foundations shall be placed after all forms on the backfill side have been removed and the concrete or masonry has attained at least its 7 days' design strength.

2.8 TESTING

The Contractor shall allow for all costs associated with compaction and foundation bearing capacity testing. The Contractor shall engage an approved Engineer to assess and certify that compaction of fill and bearing capacity of founding materials are in accordance with the minimum values specified in the Contract Documents. All test results are to be forwarded to the Project Manager/Officer.

The number of tests required is to be as follows:

a) One compaction test per 200sq.m per compacted layer.

b) Each foundation pad and strip footing shall be suitably tested as required by the Engineer.
2.9 DEFINITION OF ROCK
Material to be excavated shall be classified as either rock or ordinary excavation. Rock is classified as material which cannot be ripped by a Caterpillar D8 sized tractor in good working order fitted with a single shank ripper or rock bucket fitted with rippers and operating on a near horizontal surface requiring either a larger machine or the use of explosive to break up before being handled by mechanical equipment.

When the Project Manager/Officer is satisfied that blasting techniques are necessary, this shall require evidence from the Contractor that a qualified explosives expert is being employed and that all appropriate statutory regulations are being observed. When hard rock is believed by the Contractor to have been encountered, it shall immediately notify the Project Engineer who shall rules as to whether the material is hard rock and if so make an assessment of the volume to be excavated.

Incidental hard rock boulders occurring within the limits of the earth of greater than 2m3 shall rank as hard rock; and those of smaller dimensions as earth.

Proving material to be rock shall be the Contractor’s responsibility. The Project Architect/Officer/Engineer shall have the right to direct operations of the equipment and to nominate an operator during the proving operation.

2.10 EXTENSIONS OF TIME DUE TO ADVERSE WEATHER

Upon it becoming reasonably apparent that the progress of the works is delayed the contractor shall give written notice of the cause of the delay.

2.10.1 If it is Rainy Weather, the contractor can claim for extension of time if there is more than 5mm per hour average rainfall recorded in the area from the Fiji Metrological Office within 2 weeks’ time period from the date of rainfall (refer to Fiji Standard Form of Building Contract clause 23). Additionally, the claim for extension of time has to be check against the contractor’s work program under the approval of the Project Manager/Officer.

2.10.2 If it is Flooding, the contractor can claim for extension of time if there is a national flood alert issued by the Fiji Metrological Office on the subject site. A confirmation letter must be obtained by the contractor from the director Fiji Metrological Office and submitted to Project Manager/Officer within 2 weeks’ time period.
3.1 DESCRIPTION OF WORK
The work includes the supplying of all materials, labour, equipment and services for demolition and removal of existing structures.

3.2 RELATED WORK
This section of the specification is not necessarily complete in itself and must be read in conjunction with the other sections of the Request for Tender Documents.

3.3 REFERENCE STANDARDS
Unless specified otherwise use the following standards:
- OHSA Occupational Safety and Health Administration. Conform to all relevant Local Authority codes and regulations.

3.4 EXISTING CONDITIONS
Review all areas with the FRCS’s Representative prior to commencing the work to:
- Ensure all above and below ground pipelines and electrical equipment is either permanently out of service or de-energized and isolated.

3.5 SUBMITTALS
Before starting work, submit proposed work methods, drawings, diagrams or details to the Project Manager/Officer for review.
Submit proposed dust control and containment measures to be used to the Project Manager/Officer for review.

3.6 PROTECTION
- When required by the FRCS’s Representative, provide temporary enclosures for just containment.
- Prevent debris from blocking surface drainage system.
- Perform the work in a manner to minimize inconvenience to other operations.
- Confine operations to those areas that are to be demolished.
- Secure fence demolition areas and post adequate warning signs to keep unauthorized persons away from the area.

3.7 METHOD OF MEASUREMENT
No measurement is required for lump sum work.

3.8.1 Work
Dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction. Do not remove materials or equipment from the FRCS’s property until authorized by the Project Manager/Officer.
3.8.2 Safety Code
   a) Conform to OHSA Requirements
   b) Conform to the Owner’s safety codes and procedures
   c) Protect personnel from harmful effects of dust and corrosive or contaminated materials
      Ensure proper safety equipment is worn

3.8.3 Preparation
   a) Disconnect electrical and telephone service lines in accordance with rules and regulations
      of authorities having jurisdiction.
   b) Disconnect and cap mechanical services in accordance with requirements of local authority
      having jurisdiction.
   c) Remove, cap and dispose of other underground services including sewer and waterlines.
   d) Exterminate rodents and vermin to comply with health regulations.

3.8.4 Demolition
   a) Demolish structures, services and utilities as indicated. Terminate all services along road
      side with liaison with approval from relevant Utility Authorities.
   b) Do not use explosives unless specifically approved in writing by the FRCS’s Representative.
      Use of explosives will not be normally approved.
      Demolish to minimize dusting. Keep demolition work wetted down as required to prevent
      dust from rising.
   c) Do not sell or burn materials on site.
   d) Remove contaminated or dangerous materials from the site and dispose of in a safe manner
      to minimize danger at the site or during disposal.
   e) Pump out buried septic, fuel or storage tanks and remove tanks from the site.
   f) At the end of each day’s work, leave the work in a safe condition so that part is in danger
      of toppling or falling.

3.9 CLEAN UP
On completion, remove from the site all temporary facilities used in the performance of the work.
Remove all debris and leave the site clean.

SECTION 4 – DRAINAGE

4.1 GENERAL
This specification covers the supply, delivery, laying and jointing of reinforced concrete drainage
pipes, open unlined drains, grated lined drains, manholes and gullies, and concrete inverts.

4.1.1 Authorities and Approvals
The statutory and other authorities whose requirements shall apply to the work of this Section in
accordance with the General Conditions, and the ordinance, regulations, by-laws and the like,
specifying those requirements, shall include the following: -
   a) Fiji National Building Code and by-Laws
   b) Sewerage and Water Supply Act
c) By-Laws and Ordinances of the Local Authority having jurisdiction over the site.

Documents evidencing approval of such authorities, which are to be surrendered before the Certificate or Notice of Practical Completion is issued, shall include the following: -
   a) Work as Constructed Drawings
   b) Pipes, fittings, accessories and the like used in the Works shall bear approval marks where and as required by the regulatory authority
   c) If the responsible authority, pursuant to statutory powers vested in it, elects to perform or supply part of the Works, the contractor shall perform the necessary arrangements with the authority and pay and bear the fees payable in connection therewith.

4.1.2 Supervision and Inspection
Work shall be done by or under the direct supervision of appropriately licensed personnel and shall not commence until approval has been obtained from the Regulatory Authority.
Give at least 24 hours’ notice so that the Project Engineer may inspect at the following stages: -
   a) Excavation of trenches prior to pipe bedding
   b) Pipes erected and sealed and ready to be cleaned out
   c) Pipe testing
   d) Trench Filling to hunched pipes

4.2 REINFORCED CONCRETE PIPES
Reinforced Concrete pipes shall conform in all respects to the following Australian Standard: -
   a) For precast concrete drainage pipe – AS 1342
   b) Pipes shall be Class S and Class X under road pavements, unless noted otherwise.
   c) Spigot and socket pipes with rubber ring joints shall be used.
   d) Rubber ring joints shall be to AS 1646.

The outside and inside surfaces of the pipe shall be smooth, dense and hard and shall not be coated with cement wash or other preparation, unless so specified by the Project Manager. Reinforced Concrete pipes shall satisfy the following physical test: -

<table>
<thead>
<tr>
<th>TYPE OF TEST</th>
<th>TEST REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culverts</td>
<td>R.C. Pipes</td>
</tr>
<tr>
<td>Load Test</td>
<td>AS 1342</td>
</tr>
<tr>
<td>Absorption Test (when directed by the Project Engineer)</td>
<td>AS 1342</td>
</tr>
</tbody>
</table>

In locations other than under roadways and footpaths (e.g. allotments; and parks e.t.c.) the backfilling materials shall consist of either of the following:
   a) The best of the material (selected and approved by the Engineer) from trench excavation or
   b) Material from “on site” earthworks selected and approved by the Engineer.

If, in the Project Engineer’s opinion, material from item (a) above is not suitable for backfilling then material from item (b) above shall be by the Contractor. The cost of this work shall be included in the drainage items and Lump Sum of the Contract generally.
The trench backfill material in locations other than under roadways and footpaths shall be compacted in layers to a dry density not less than 90% of the maximum dry density as determined by the modified A.A.S.H.O. Compaction test. Any settlement shall be made good by the Contractor, prior to the end of the maintenance period.

When elliptical pipes with circular reinforcement or circular pipes with elliptical reinforcement are used, the pipes shall be laid in such a position that the manufacturer marks, designating the “Top” or “Bottom” of the pipe shall not be more than 5 degrees from a vertical plane through the longitudinal axis of the pipe.

The pipe ends shall be thoroughly cleaned and wetted with water before the joint is made. Stiff mortar shall then be placed in the lower half of the socket or groove of the pipe section already laid and other upper half of the spigot or tongue of the section being laid. The two pipe sections shall then be tightly joined with their inner surfaces flush and even.

After the joint is made, the inside of the pipes and annular recess at the ends of the pipes shall be cleaned. The recess shall then be fitted with mortar and finished smooth and even with the inside surface of the pipes. Joints on pipes greater than 600mm in diameter shall not be finished on the inside until all fill over the pipe has been completed. No backfill shall be carried out until joints have been inspected and passed.

Jointing mortar shall be of a smooth consistency, consisting of 1 part Portland Cement to 2 parts of Fine Sand, with water content not greater than 20 liters/bag of cement.

All materials, processes and finished reinforced concrete pipes shall, before acceptance, be subject to inspection and approval by the Project Manager/Engineer.

Finished reinforced concrete pipes shall be subject to final inspection at the point of delivery, and any pipes which, independent of any physical tests herein specified, fall to meet the requirements of the current AS 1342 (pipes) shall be rejected. PIPES showing only internal cracks or only external cracks may be accepted, provided such cracks do not visibly penetrate full thickness or do not exceed 1mm opening for 250mm or more in length.

Laying shall begin at the downstream end of the line with the socket or grooved ends of the pipe facing upstream. When the pipes are laid, the barrel of each pipe shall be in contact with the bedding material throughout its full length exclusive of the socket. Pipe sockets shall not bear on the bottom of the trench.

Pipes shall be bedded for 120 degrees of their circumference on at least 75mm of sand, or other approved material. Similar material shall be placed at the side of the pipe up to the mid-height and thoroughly compacted.

Under roadways and footpaths any remaining backfill material shall be selected and approved by the Project Engineer. The backfill shall be compacted in layers not greater than 150mm thick to a
density to less than 95% of the maximum dry density as determined by the Modified A.S.H.O.
compaction Test (Queensland Main Roads Department Test No. Q8-B) up to the underside of the
gravel box or the profile of the footpath, whichever is applicable. If, in the opinion of the Project
Engineer, the “on Site” material is not suitable for backfilling over pipes, the Contractor shall import
at its own expense a material acceptable to the Engineer (a material with a Design C.B.R. not less
than 15% would be an acceptable material).

Completed joints shall be protected from the direct rays of the sun until backfilling takes place.
Joints in pipes shall not be made under water. The trench must be dewatered to facilitate joint
making and inspection. Precautions must be taken to prevent erosion of joint by moving currents
or water. In wet ground, if approved by the Project Engineer, joints may be made using clay compo.
The clay compo shall be kept covered with a wet bag after being made and shall be used within
one hour of being prepared.

‘Clay’ shall be approved clean plastic clay, free from soil, roots, gravel, grit or any foreign matter.
A sufficient amount of water shall be mixed with the clay to give a smooth pug free from lumps.
Dry cement shall be gradually added to the clay pug in the proportion by volume of one part of
cement to one part of clay pug and the whole mass kneaded until thoroughly mixed, additional
water being added if required until an approved consistency is obtained. A sample of the compo
on being sliced through or broken shall not show any streak or lumps of cement or clay. Sample
balls from time to time as directed, and allowed to set for the Project Engineer’s inspection.

Minimum cover over pipes shall unless otherwise specified, be as follows:
   a) Pipes not subject to vehicle        450mm
   b) Pipes subject to vehicles loading:
      o Not in roadways                   600mm
      o Under unsealed roadways           750mm
      o Under sealed roadways             600mm

4.3 GRATED LINED DRAINS
The grated lined drain shall comprise of 100mm thick reinforced concrete of 20 Mpa strength to
the base and walls complete with gatic grating covers as detailed on the contract drawings.

4.4 GULLIES, MANHOLES, ETC.
Concrete used throughout the works shall conform to the Specification for Portland Cement
Concrete. The concrete shall be of the following classes unless otherwise specified.
   a) Gullies, Manholes and junction chambers in roads – 20 Mpa/20mm aggregate
   b) Field Gullies (cast in-situ)- 15Mpa/20m aggregate
   c) Precast front, back a side stones to gullies – 17 Mpa/20mm aggregate
   d) Infill to concrete manhole covers – 17 Mpa/20mm aggregate.
   e) Reinforcing, where used, shall conform to the Specification for Reinforcing Steel.
   f) Rendering – 1 part Portland cement to 2 parts Fine Sand.

Where scheduled separately, the quantity of excavation will be taken as the volume in the solid
before excavation. All excavated material will remain the property of the FRCS, and shall be spoiled as directed offsite.

The Contractor is solely responsible for the maintenance of trenches and is liable for any damage which may cause to any water pies, conduits, etc., through the collapse of same. Where directed by the Project Engineer, timbering shall be used, the cost of which will be considered as being in the schedule rate for excavation or in the Bulk of the Contract generally.

Backfilling of excavated material shall be carried out by depositing and compacting the material on 150mm layers. The cost of backfilling will be taken as included in the schedule rate for excavation in the Bulk Sum. Backfill for works under roads and paved footpath shall be selected granular material compacted to 90% modified compaction to AS 1289 Test E2.1 to 1 layer below subgrade, with the final layer to subgrade at 95% modified compaction to AS 1289 Test E2.1

Cost of any pumping necessary for keeping the excavated area dry will be considered as being included in the schedule rate for excavation or in Bulk Sum.

The Contractor will be responsible for all damage caused in the carrying out of the works to any gas or water main, PTC, or Electrical Power Cable or conduit or any other public service whatever, the presence of which was made known to the Contractor prior to any damage occurring.

Where work is being carried out on private property, the Contractor shall carry out such work with a minimum of inconvenience to the FRCS. All items located on such property including lawns, garden, etc., are to be reinstated and left in the same condition as before the commencement of the work.

As shown on the Plans or where directed by the Project Engineer, the bottom half diameter or invert section of in-situ concrete sewers is to be rendered 12mm thick with cement rendering. Such rendering is to be applied as soon as practicable after the removal of formwork and in no case more than 3 days after placing the concrete in the sewer.

The interior face of gullies is to be rendered and interior of access and inspection chambers to the height of half the diameter of the highest pipe connecting thereto.

Gullies and manholes are to be constructed to the form and dimensions shown on the Drawing. Where the ground is solid the Project Engineer may instruct that back forms need not be used in the construction of manholes and gullies, the concrete being poured against the earth. Where this is done, the thickness of the wall of such gullies or access chambers is to be increased to a minimum of 50mm greater than the dimension shown on the plan. This extra 50mm will not be paid for, quantities for payment being computed on the dimensions shown on the Drawings.

4.5 SCHEDULE OF TESTS

4.5.1 Testing
Tests: Obtain the tests specified below from an independent testing authority. Do not proceed
with work subject to testing until tests are satisfactorily completed and the approval of the Project
Engineer has been given.

**Non Compliance:** Where tests indicate that the required Contract standards have not been
achieved, take remedial action and arrange for any re-testing required by the Project Engineer. All
costs incurred in connection with retesting, shall be deemed to be included in the Contract Sum.

**Records**
Compliance assessment: Arrange for the independent testing authority to submit three copies of
each test result direct to the Project Engineer.

**Methods**
Unless otherwise specified use applicable standard test methods specified in Australian Standards.
Use wet preparation methods where applicable.

**Sampling**
**Take and prepare the samples required for the specified tests.**

**4.5.2 Costs of Tests**
Include in the Contract Sum for all costs including attendance associated with these tests. Provide
all-inclusive rates for the tests nominated below.

**4.5.3 Material Tests**
Specified properties of materials apply to their condition as installed in the completed Works. Where it is expected that properties will change significantly during construction, adjust the
delivered material accordingly.

**4.6 MATERIALS TEST STANDARDS**

**4.6.1 Materials and Standards**

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>AS 1012</td>
</tr>
<tr>
<td>Aggregates</td>
<td>AS 1141, AS 1289</td>
</tr>
<tr>
<td>Sub-base and Base course</td>
<td>AS 1141 and AS 1289</td>
</tr>
<tr>
<td>Soils</td>
<td>AS 1289</td>
</tr>
</tbody>
</table>

**4.6.2 Compliance Tests**
**Sub-base and Base Course**
To AS 1141 and AS 1289
Particle size distribution and material properties listed in MATERIALS–SUBBASE AND BASECOURSE.

One set of tests 7 days prior to first delivery of material to the site. One set of tests per 500m3 or
part there of each type of material incorporated into the works.

**4.6.3 Compaction Testing**
Provide to the manager the following test results:
   a) Excavated Subgrades
• 3 sets of dry density ratio tests to AS 1289, test E1, E3.1 and E4.1

b) Filling
• Sets of dry density ratio tests to AS 128, test #1.1, E3 and D4.1

c) Sub-base and Base course
• Sets of dry density ratio tests to AS 1289, test E1.1, E3.1 and E4.1

SECTION 5 – CONCRETE WORK

5.1 STANDARDS
All works shall be carried out in accordance with the requirements of the National Building Code of Fiji and associated documents and the following Standards:
Comply with relevant standards including the following:

a) AS3972 Portland and blended cements
b) AS2758.1 Aggregates and rock for engineering purposes—Concrete aggregates
c) AS1141 Methods for sampling and testing aggregates
d) AS1478 Chemical admixtures for concrete, mortar and grout
e) NZS3104 Specification for concrete production
f) NZS3109 Concrete Construction
g) NZS3112 Methods of test for concrete
h) NZS3114 Concrete Surface Finishes

5.2 MATERIALS

General: Unless otherwise stated all concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, approved additives and water, proportioned and mixed as detailed in this Specification. All such materials shall conform to the requirements of this Specification.

Portland Cement: All cement used shall be Portland cement type A and shall comply with AS3972.

Water: Water shall be free from matter injurious to concrete reinforcing bars, pre-stressing bars and strands and any other embedded items. Injurious materials include acids, alkalis, salts, sugars, organic materials and oils.

Aggregate: All aggregates shall comply with the requirements of AS27581.1 Coral aggregates shall be washed with potable water to remove any salts. The maximum nominal size of aggregate shall be 20mm. Aggregate may be subjected to any or all of the tests detailed in AS1141.

Fine aggregate shall be sand, clean and free from detrimental matter and salts.

Coarse aggregate shall be clean and free from dust and salts. Individual pieces shall be roughly cubic and aggregate containing an excess of flake shaped stones will not be approved.

Aggregate shall be stored so as to prevent the mixture of one size with another. Aggregates shall not be stored in direct contact with the ground on or in such a manner that allows intrusion of foreign matter.
**Admixtures:** Chemical Admixtures to concrete shall only be used with the prior approval of the Superintendent after detailed submission and in accordance with AS1478.

### 5.3 PERFORMANCE REQUIREMENTS FOR CONCRETE

**General:** Unless shown otherwise on the structural drawings, all concrete shall have the following minimum 28 days’ compressive strength slump and cement content, irrespective of coarse aggregate used in the mix.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strength</th>
<th>Slump (mm)</th>
<th>Min Cement Content (Kg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Paving &amp; kerb</td>
<td>25 Mpa</td>
<td>80</td>
<td>360</td>
</tr>
<tr>
<td>Grout to kerb</td>
<td>17.5 Mpa</td>
<td>230#</td>
<td>320</td>
</tr>
</tbody>
</table>

**Note:** (#) The 230 slump may be achieved by the addition of Super plasticizers REHOBUILD716 used strictly in accordance with the manufacturer’s recommendations.

**Mix Design:** The Contractor shall submit for approval by the Project Architect/Officer/Engineer details of the proposed mix designs at least two (2) weeks prior to any concrete being required for the works.

Notwithstanding any approval being given by the Project Officer, the Contractor shall be solely responsible for the production of concrete having properties in accordance with Specification requirements. The following details for each mix design are required: Mix Designation Mark, class of concrete, proportion by weight of individual ingredients and total weight of batch, admixtures and quantity to be incorporated, slump, target strength, on-site quality control measures.

**Testing:** Slump Test: Perform one test per truckload, or per twenty (20) cubic meters poured, to be tested in compliance with NZS3112.

**Acceptance:** The compressive strength of the concrete will be deemed to comply with the specified strength grade and hence be accepted if it complies with NZS3112 & NZS 3104 for Project assessment testing. Both plastic and hardened concrete shall be liable for rejection if any of the conditions described below are present:

1. Plastic concrete may be rejected if, after completion of mixing but prior to site handling:
   a) the slump, differs from the specified slump by more than the tolerances permitted (for a target slump of 80mm or less, the tolerance is +15mm, and for a target slump greater than 80mm, the tolerance is +30mm); or
   b) the time since completion of mixing is greater than 1.5 hours; or
   c) the appearance and cohesiveness of the particular quantity is significantly different from previously supplied quantities of the same specification.
Hardened concrete shall be liable to rejection if:

a) It does not satisfy the strength requirements of this specification,
b) it is porous, segregated, honey-combed, or contains surface defects; or
c) it fails to comply with other requirements of this specification.

Where hardened concrete is liable to rejection, the concrete may be accepted if the conditions outlined in clause 17.1.7.3 of AS3600 are met.

All remedial work to bring rejected concrete to an acceptable standard shall be to the Contractor’s cost and to the approval of the Project Manager/Officer.

5.4 CONCRETE TESTING

The Contractor shall provide all labour, materials and equipment, such as test cylinder molds, the slump test apparatus, that are required to test the concrete in accordance with codes referred to in the clause above.

The minimum frequency of sampling of the concrete of each type shall be in accordance with the following (per days).

a) Footing and bearing walls - 1 sample per batch
b) Slab on ground - 1 sample per every 3 batches

Compression testing shall be carried out for every sample by an independent laboratory approved by the Project Architect/Officer. The Contractor shall pay for all tests.

Provide test result certificates for all tests specified, showing the full history of sampling and testing of all specimens. Cost of required testing to be included in the Tender sum by the Contractor.

5.5 FORMWORK

The formwork shall be as necessary to obtain the finishes specified and so constructed as to remain rigid and true to line and level during placing of concrete. Refer to NZS 3114.

Formwork and concreting shall comply with NZS 31-0 Sections 5 and 7. Formwork shall be designed and constructed that concrete can be placed and thoroughly compacted without loss of grout. All joints shall be tight and close fitting to prevent leakage.

5.6 SUPPLY OF CONCRETE

5.6.1 Ready Mix

Approval of Source: All concrete supplied for this Contract shall preferably mixed concrete. On site batching shall require permission from the Project Architect/Officer/Engineer and shall be in accordance with the Site Mixed section immediately below.
5.6.2 On Site Mix Concrete

Should the delivery of ready mix concrete not be available, the Contractor may be permitted to use on-site mix concrete with the use of motorized concrete mixers having a minimum batch size of 2m³ (two cubic meters).

Such on site mix concrete shall be to the following requirements, carried out to the strict supervision of the Principal or his nominee.

**Note:** Coral sand and aggregate shall not be used in the concrete mix.

**Method: On Site Mix Concrete**

a) Ensure that the mix proportions are suitable for the specific job. See Table 1 for a guide to the correct mix.

b) Use fresh cement, clean aggregate and water. Cement which has formed into hard lumps and aggregate which contains excessive dust and other foreign matter, or is soft or flaky shall not be used.

c) When calculating quantities of materials required add approximately 10 percent to each amount to allow for losses in storage and for irregularities in sub-foundations and floors on ground, etc.

d) The strength and durability of concrete depend largely on the amount of water used with a given amount of cement. Refer to Table 2 for a guide to suitable water content for each bag of cement and the expected compressive strength of concrete. The amount of water added to the concrete should be reduced if the aggregate contains moisture.

e) If the concrete consistency in the first batch is too dry, then reduce the amounts of aggregate in the subsequent batches. Do not add water in excess of the amount recommended. No sloppy batches to be poured.

f) When placing concrete, certain precautions have to be taken to ensure that:

   i. Form work and reinforcement are not damaged or dislodged

   ii. The concrete does not segregate, i.e. the cement paste does not separate from the coarse aggregate.

   iii. Placing of the concrete should start from the corners of the formwork and from the lowest level if the surface is sloping.


g) Thorough compaction of the concrete is essential to provide concrete which gives:

   i. Water tightness

   ii. Maximum strength

   iii. Maximum durability Good appearance.

h) Cure the concrete by keeping it damp for seven days. Lack of curing can result in unsightly surface cracking and weaker, less durable concrete.

**Concrete Mixtures**

**Note:** Site mixed concrete shall meet the minimum cement contents given above.
TABLE 1 (Concrete Mix by Weight)

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Nominal Proportion</th>
<th>Cement (40 Kg bags)</th>
<th>Sand M3</th>
<th>Gravel M3</th>
<th>Water Litres per bag Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1:1 ½ :3 (32Mpa)</td>
<td>1</td>
<td>½</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>1:2.4 (25Mpa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High structural strength concrete for fence posts, heavy-duty floor, driveways, paths and kerb and gutters in parking areas.

Commonly adopted mixture for footings, reinforced concrete footing, beams and internal floor slabs.

TABLE 2 (Concrete Mix by Volume)

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Nominal Proportion</th>
<th>Cement (40 Kg bags)</th>
<th>Sand M3</th>
<th>Gravel M3</th>
<th>Water Litres per bag Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1:1/2 :3</td>
<td>8</td>
<td>½</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>1:2:4</td>
<td>6</td>
<td>½</td>
<td>1</td>
<td>20</td>
</tr>
</tbody>
</table>

Aggregate Size:

The greatest economy is achieved when the largest maximum size aggregate possible is used. Generally, the maximum size should not exceed one-fifth the maximum thickness of the concrete, nor three-quarters of the clear spacing between reinforcement, if applicable. 20mm maximum size aggregate is suitable for most jobs. A mix of 10 & 20mm size aggregate will be a perfect combination to achieve a denser mix.

5.7 PLACING AND COMPACTION

No concrete shall be placed without the Project Manager’s/Officer’s approval. The Contractor shall seek such approval at least 48 hours prior to the formwork and reinforcement being ready for inspection and the intended time for the pour to commence. Adequate time, but in any case not less than two (2) hours duration, shall be allowed by Contractor for the Project Managers/Officer’s inspection.

Concrete placement shall not commence until inspections have been carried out, outstanding work completed or corrected and approval to proceed given by the Project Manager/Officer.

All built-in pipes, fittings, guards, block-outs, bolts, reinforcement and other fittings shall be in position before placing is commenced.
**Methods of Placement:**

Concrete shall be transported from the place of mixing to its final location as quickly as practicable by means which will prevent the aggregation or loss of component materials.

Concrete shall be deposited as nearly as practicable in its final position. Free dropping of concrete from a height greater than .5 meters on floor slabs or dumping a large quantity away from its final position and working it along the forms will not be permitted.

Concrete shall be placed in its final position before perceptible setting takes place.

Placing shall be carried out at such a rate and in such a manner that placed concrete which is partially set is not subsequently disturbed. Concrete that is partially set before placing in its final position, or concrete that is contaminated by foreign materials shall not be placed.

**Compaction:**

All concrete shall be compacted using suitably sized vibrators.

At least 2 vibrators shall be used, and an adequate number of stand-by vibrators shall be available on site in case of breakdowns.

Any concrete which is re-handled after initial vibration shall be re-vibrated immediately prior to final screeding, to ensure uniform, dense homogenous concrete throughout its entire mass, including the surface layer.

**Hot Weather Requirements:**

In hot weather, precautions shall be taken to avoid premature stiffening of fresh mix and to reduce water absorption and evaporation losses.

Where the temperature of the surrounding air is higher than 32°C, the following provisions shall apply:

a) The formwork shall be continuously sprayed with cold water in advance of the concreting. Excess water shall be removed from the inside of the forms immediately prior to the concrete placement. The reinforcement and the formwork, if metal forms are used, shall be protected from the effects of hot winds and direct sunlight.

b) The concrete shall have a temperature not higher than 32°C when placed, wither following the use of use of chilled mixing water, or by water spraying of the coarse aggregate of both, and if necessary by covering the container in which the concrete is transported to the forms.

c) When concrete is placed in dry windy conditions, or when the air temperature exceeds 32°C, or when the Project Engineer deems that early and rapid loss of water from the mix may be detrimental to the concrete work, Master Builders “Confilm” will be applied immediately after initial screeding.

d) The concrete shall be mixed, transported, placed and compacted as rapidly as possible.
5.8 FINISHING

General:

The surface of the placed concrete shall be screeded with a steel shod screed and brought to a smooth and level surface. After the concrete has hardened it shall be smoothed with a power trowelling machine to remove all corrugations or irregularities.

a) All slabs surfaces shall be steel float finished using a power trowelling machine
b) All external concrete pavements shall be stiff broom finished after laying. Broom strokes shall be transverse to the direction of fall on the pavement.
c) Any concrete cast against forms shall have a class described in the formwork section of this specification.

If the result is not obtained, the Project Architect/Officer may accept the work as satisfactory provided that remedial works as directed are satisfactorily carried out by the Contractor at its own expense immediately upon removal of the forms. The Contractor’s concreting techniques must be adjusted to give the surface finish specified herein. All concrete surfaces shall be finished to a tolerance of 3mm over any 3-meter length.

5.9 CURING

Once finishing is completed the exposed concrete surfaces shall be kept constantly in a damp or set condition by an approved method such as being covered with a plastic membrane held in place by sand, or other satisfactory method. Joints should be adequately lapped to prevent escape of moisture.

The curing shall be maintained for seven (7) days after the pouring of the concrete. Alternatively, the Contractor may apply in writing to the Project Architect/Officer for the use of a curing compound, indicating the type and brand to be used.

Under no circumstances shall curing compound be applied on construction joints or surfaces that are to be topped or painted.

5.10 BEDDING SAND

Bedding sand shall be spread in the positions and thicknesses shown on the drawings or a minimum of 50mm. Bedding sand shall be well graded and passing a 4.75mm sieve. The sand shall be free of deleterious soluble salts or other contaminants.

5.11 TRAFFIC

Traffic or loads of any kind will not be allowed on any concrete for fourteen (14) days from the day of pouring except that concrete which is fully supported on compacted gravel and may only carry traffic approved by the Project Architect/Officer within this period.
6.0 ELECTRICAL & CCTV

6.1 WORKMANSHIP
General:
Carry out all work in a neat and serviceable manner. Follow best trade practices and comply with any manufacturer’s recommendations.

6.2 Finish & Cleaning
The completely erected installation shall be handed over in a perfectly clean condition with all rust and dirt removed paintwork in good clean condition with erection scratches and other damage marks made good and bright parts properly cleaned and polished. Keep the work areas clean and tidy at all times. Remove all rubbish as it accumulates. On completion, remove all debris and waste caused directly or indirectly by the work and leave the installation and surrounding areas completely clean.

6.3 GUARANTEE
The Access Control, CCTV & electrical System Subcontractor shall provide a written guarantee in respect of all materials supplied under the Contract against defects which may occur or be found in workmanship, materials and design for a period of twelve (12) calendar months in service after the date of Practical Completion Certificate as detailed below.

All defects, fair wear and tear excepted, shall be made good free of all costs to the Owner, whether or not the workmanship and materials have been previously inspected and accepted.

6.4 MAINTENANCE MANUALS
Provide 3 sets of Maintenance Manuals bound and indexed in Black A4 ring binders labelled with the project name and purpose on the front cover and spine. The manuals shall include the following information:

a) Brief outline description of systems and principal design details
b) System schematics
c) Operating instructions for the equipment installed
d) Schedule of all equipment showing location, maker’s name and details of local agent
e) Provide spare parts lists, manufacturers' technical information, with detailed wiring diagrams for all composite equipment
f) A description of recommended maintenance procedures and the desirable frequency thereof, recommended lubricants, and recommendations for locating faults and isolating equipment
g) Commissioning results, copies of works test certificates
h) A set of As-built drawings in A3 shall be provided for inclusion in each copy of the Manual.
6.5 DEMONSTRATION & INSTRUCTION TO FRCS AND STAFF

The Access Control, CCTV & electrical Subcontractor shall provide all instructions to members of the FRCS’s organisation as necessary for them to recognise defective conditions in the Contract plant.

Formal instruction shall be coordinated with the FRCS via the Main Subcontractor and shall take place following provision and acceptance of final as-built, commissioning, and maintenance documentation, and prior to Practical Completion.

The Subcontractor shall also provide such informal instruction as may be required prior to the formal instruction. The Subcontractor shall assign a person thoroughly familiar with the Contract plant for the purpose of such instruction for a period of 2 complete days during which period his time shall be completely given over to instruction. Instruction shall be given as follows:

a) Explain the function and operation of all equipment, and indicate where these items are dealt with in the Operating and Maintenance instructions.

b) Demonstrate all indicating instruments, gauges and settings of equipment and indicate the current readings of such items.

c) Indicate where and how any item of Contract equipment can be disconnected or isolated.

6.6 COMMISSIONING, INSPECTION AND TESTING

Four weeks prior to carrying out any inspections, testing and commissioning, submit details of the test procedures proposed, together with Test/Report Sheet formats for the Engineer's review. These procedures and formats, once acceptable to the Engineer, shall be used as the basis of all Inspections, Testing and Commissioning.

Prior to inspection/commissioning of the Works by the Engineer for the purposes of certifying Practical Completion, provide the Engineer with completed, signed Communication Certificate of Compliance, Test/Inspection/Commissioning Reports on the equipment, services, etc., indicating that the Works are now ready for inspection. The contents and results of these Reports must be acceptable to the Engineer, and are an essential prerequisite to the Engineer proceeding with inspection/commissioning of the work for the purposes of the issue of the Certificate of Practical Completion.

The Certificate of Practical Completion does not become due until site testing and commissioning is complete to the satisfaction of the Engineer, and the completed Certificate of Compliance issued to the Engineer.

Arrange for Subcontractors to be in attendance where inspection testing and/or commissioning of the installation involves their equipment and where specifically requested herein.

Repair or replace as instructed by the Engineer, at no charge, any item or features not complying with these Documents. Allow the Engineer and any relevant local bodies the opportunity of attending and witnessing the tests and commissioning. Include the following in the test procedures as a minimum:

a) Check complete installation visually for compliance with the Specification
b) Check all control panels for operation of switches, circuit protection, contactors, controls etc.
c) Continuity and insulation resistance checks on all wiring and cabling. Ensure sensitive equipment is disconnected. Check and test all RCD equipment for correct operation.
d) Check all labelling
e) Check fixings of all equipment and systems installation to ensure stability under possible seismic conditions.
f) Test and commission all components, items and systems both independently and in association with the complete installation.
g) Allow to employ the manufacturers of any specialist equipment installed to test and commission that equipment
h) After commissioning give at least two weeks’ notice in writing to the Engineer that the installation is ready for final demonstration
i) Demonstrate the satisfactory operation of the installation and all component parts to the satisfaction of the Engineer
j) Provide all equipment and apparatus necessary for this demonstration
k) Evidence currency of calibration of equipment to be used in testing and commissioning procedures. Calibration to be in accordance with AS3912.
l) Evidence of qualification of all personnel proposed for carrying out any commissioning related activities.
m) Records of all pre-commissioning checks and commissioning data be certified as being conducted in accordance with agreed and approved
n) Manufacturers’ certificates for all proprietary items, e.g. CCTV Cameras etc. to confirm that the installation complies with their installation requirements prior to start-up of equipment. Certificates shall also be provided at commencement of equipment installation to confirm their requirements with respect to installation are being provided for.
o) Carry out any tests the Engineer may require to demonstrate that the installation functions as specified or intended.

6.7 CCTV TESTING STANDARDS
   a) SAA/SNZ HB27: Handbook for testing Backbone Cable installations
   b) AS/NZS 3087.1:2003: Telecommunications Installations - Generic cabling systems - specification for the testing of balanced communications cabling in accordance with values set in AS/NZS 3080:2003

6.8 ELECTRICAL TESTING STANDARDS
   Inspect and test the complete system in accordance with Fiji National Building Code and AS3000, Fiji Electricity Act and obtain Certificate of Compliance from the Fiji Electricity Authority.
FORM OF TENDER

FOR

CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE
LAUTOKA
FORM OF TENDER: TENDER DETAILS

APPENDIX 1: PROJECT DURATION AND COMPLETION DETAILS
APPENDIX 2: SUMMARY OF TRADES
APPENDIX 3: LABOUR RATES SCHEDULE
APPENDIX 4: PLANT HIRE RATES
APPENDIX 5: ADDITIONAL INFORMATION REQUIRED FROM TENDERERS

FORM OF TENDER  
(to be submitted with the Tender Submission)

Tender for: CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA.

Name of Tenderer…………………………………………………………………………….

We, the undersigned hereby offer to execute and complete the whole works as stated on the said documents and as required for as follows:

Construction of the said Project for the Fixed Lump Sum: - (in words and numbers)

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

TOTAL TENDER PRICE (F$ .........................VIP)

The above fixed Lump Sum must include VAT (9%) and with no provision for fluctuations in the cost of Labor and Materials.

As witness our hands this day ............. Day of .............................................., 2017

Tenderer’s Name: .................................................................

Signature: .................................................................

Office Stamp .................................................................

Witness (Name in Capitals) .................................................................

Signature: .................................................................

Occupation .................................................................
APPENDIX 1

PROJECT DURATION AND COMPLETION DETAILS

Tender for: CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA.

a) Duration : 10 Calendar Weeks

b) Defects Liability Period
   (Clause 15, 16 & 30) * : 1 Year

c) Retention : 10% (5% to be released upon Practical completion and 5% at the end of the Defects Liability Period).

d) Liquidated and Ascertained Damaged (Clause 22) * : $1000 per day

e) Public Liability Insurance
   (Clause 19 (1) a) * : $500,000.00 (minimum)

f) Insurance for the works : Value of the total Contract Sum (minimum)

g) Contractors All Risks : Approved Contract Sum plus 10%

h) Workers Compensation Insurance : $ 500,000.00

* Clauses referred to above are contained in the Fiji Standard Form of Building Contract (Without quantities Public Works Edition 1978)
## APPENDIX 2

### SUMMARY OF TRADES/COSTS

<table>
<thead>
<tr>
<th>No</th>
<th>Trade Description</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Preliminaries &amp; General</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Demolition (including cartage)</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>Fill &amp; Compacting</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>Concrete Slab</td>
<td></td>
</tr>
<tr>
<td>5.0</td>
<td>Fencing</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>Build existing chamber &amp; cover</td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>Motor operated gate</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>Drain (making good &amp; new)</td>
<td></td>
</tr>
<tr>
<td>9.0</td>
<td>Electrical flood light &amp; power outlet (including post)</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>CCTV</td>
<td></td>
</tr>
<tr>
<td>11.0</td>
<td>Track (guide rail) on slab</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td>Markings &amp; Signs (entry, exit, radiation, danger etc)</td>
<td></td>
</tr>
</tbody>
</table>

Sub Total

Plus VAT (9%)

**TOTAL TENDERED SUM**

---

**Signature of Tenderer:** ………………………………………………………………………………………

**Tenderer's Stamp** : ………………………………………………………………………………………

**Date** : ……………………………
APPENDIX 3    LABOUR RATES SCHEDULE

Labor Rates Summary

3.1 All Tenderers must submit their Labor and Plant rates that are applicable for this particular Project and this requirement is compulsory. If any job/trade or plant/equipment classification is missing from below, the Tenderer is required to add into the spaces provided.

3.2 Labor Rates Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>Job Classification (Trades)</th>
<th>Hourly Rate ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Supervisor</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Foreman</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Leading Hand</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Carpenter A</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Carpenter B</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Plaster man</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Block layer</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Welder</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Plumber</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Electrician</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Painter</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Labor</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Site Clerk</td>
<td></td>
</tr>
</tbody>
</table>
Plant/Equipment Rates Summary

4.1 All Tenderers are to submit their Plant/equipment rate that is applicable to this Particular Project as is compulsory. If any job or equipment classification is missing from below the Tenderer is required to add into the spaces provided.

<table>
<thead>
<tr>
<th>Item</th>
<th>Plant/Equipment Classification</th>
<th>Hourly Rate ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Truck Driver</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bulldozer Driver</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Excavator Driver</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Concrete Truck Driver</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Telephone Crane Driver/Operator</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Flat Top Truck (Cartage)</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 5

ADDITIONAL INFORMATION REQUIRED FROM ALL TENDERERS

PROJECT: CIVIL WORKS FOR THE PROPOSED FRCS X-RAY SITE LAUTOKA.

Contents

A. Structure and Organization
B. Financial Status
C. Resources (Personnel/Plant/Equipment)
D. Resources (Other)
E. Relevant Experience

Notes to Tenderers

1. Please fill-in clearly and neatly the spaces provided.
2. Additional information may be attached at the back, if necessary.
3. Any queries regarding the filling of the Form of Tender are to be directed to the Project Manager.
A \hspace{1cm} STRUCTURE AND ORGANIZATION

1. Name of Company:
Certificate No.:
Tax Identification No. (T.I.N)
Contact Person:
Telephone Number: \hspace{1cm} Fax Number:
Mobile: \hspace{1cm} E-mail Address:

2. Description of Company (for example, General Contractor)

3. Number of years’ experience as a General Contractor in Fiji:

4. Please present organization chart showing the Tenderer/Company structure including the position of directors and key personnel.
B  **FINANCIAL STATUS**

Annual value of construction works undertaken for each of the last two years.

<table>
<thead>
<tr>
<th>2015</th>
<th>2016</th>
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</table>


...........................................................................................................................................................................
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3. Attach copies of the Tenderer's previous two years' accounts profits assets/liabilities and other financial data, which would be considered useful.

4. Name and address of Banker where references can be obtained. Provide Bankers Report financial status and overdraft facilities.
### RESOURCES: PERSONNEL / PLANT EQUIPMENT

1. **Total Number of Staff in the Company:**

<table>
<thead>
<tr>
<th>Technical:</th>
<th>Administrative:</th>
</tr>
</thead>
</table>

2. **Staff proposed to work on this Project:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>No. of Years of experience in construction:</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

3. **Main plant/equipment:**

Considered by the Tenderer to be necessary for executing the Project and whether the plant is owned, or will be purchased or hired.

<table>
<thead>
<tr>
<th>Plant/Equipment</th>
<th>Owned ✅</th>
<th>To be Purchased ✅</th>
<th>To be Hired ✅</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
D  RESOURCES: OTHER

1. State any part of the works to be undertaken by subcontractor(s), if any, and give name(s) and address of the subcontractor(s).

2. Provide details of ‘off-site’ fabrication available to the Tenderer.

3. Provide Tentative Work Program (Gantt Chart).

E  RELEVANT EXPERIENCE

1. Provide pictures and value of past similar projects.

2. Attach Reference Letter from previous FRCSs