GOVERNMENT OF THE REPUBLIC OF TRINIDAD AND TOBAGO

MINISTRY OF AGRICULTURE, LAND AND FISHERIES

2022/2023

TENDER DOCUMENT FOR CATEGORY GROUP C – BUILDING REPAIRS AND REFURBISHMENT

CONTRACT 3:

CAU22/23-PLER01: REFURBISHMENT OF PRAEDIAL LARCENY SQUAD FACILITY, EL REPOSO

APRIL 2023

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INSTRUCTIONS TO TENDERERS

INSTRUCTIONS TO TENDERERS

Tenderers are advised to read all instructions carefully – since failure to comply may result in the rejection of their offer.

1. GENERAL

The Ministry of Agriculture, Land and Fisheries (MALF) is desirous of undertaking this tender as indicated in the Invitation Letter and has invited contractors to tender according to the Invitation Letter and all the documents attached.

2. SUBMISSION OF TENDER

2.1 Tenderers must provide the following in their tender:

a) the full name, signature, office and business address of the tenderer in block letters as well as the company's official stamp;

b) signature of the person making the offer, or in the case of a company, partnership or business firm, by a duly authorized officer or employee of such company, partnership or the business firm;

c) the **initials** of the person making any offer, must be inserted next to any alterations or erasures made or in the case of a company, partnership or business firm, by a duly authorized officer or employee of such company, partnership or business firm;

d) all information requested in the tender documents should be submitted in the format requested.

2.2 The tenderer must submit in the Financial Tender Proposal the following documents:

a) The Form of Tender (completed)

b) Bills of Quantities (completed) as required in this tender document

2.3 The tenderer must submit in the Technical Information Package the following documents:

a) The following mandatory documents:

- Value Added Tax Clearance Certificate dated not more than six (6) months prior to closing date of tender;
- Income Tax Clearance Certificate dated not more than six (6) months prior to closing date of tender;
- NIB Certificate of Compliance dated not more than six (6) months prior to closing date of tender;
- Certificate of Incorporation/Letter of Continuance/Certificate of Registration;
- Audited financial statements for one (1) year within the last three (3) year period;

b) All information requested in the Technical Information Package that will facilitate assessment of a tenderer's capability and capacity to undertake the works. This information falls under the main categories of Human Resource Capacity, Past Experience, Equipment Capability and Financial Capability.

c) All other information that the Tenderer may deem relevant for the purposes of this tender.

2.4 During the evaluation process the Ministry reserves the right to request any clarification from any contractor without modifying the contents of the submission.

2.5 Documents are not transferable. They shall be completed, signed and submitted by the person, company or firm in whose favour they have been issued. In case of a company or firm, the person who is authorised by its Board of Directors, or governing body, shall sign the submissions on behalf of the Company or Firm. In such a case, an extract of the relevant minutes or resolution of the Board of

Directors, authorising the person to sign the submissions on behalf of the company or firm, signed and attested by the chairman of the company or firm and duly notarized, shall be enclosed in the submission.

2.6 Two (2) soft copies (each on a separate USB Flash drive in PDF format) of each tender submission must be placed in a sealed envelope and addressed to the Administrative Officer IV – Procurement Unit, Ministry of Agriculture, Land and Fisheries, Corner Narsaloo Ramaya Marg Road and Soogrim Trace, Chaguanas and clearly marked on the outside:-

TENDER GROUP ……C……

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Note 1: Each Flash drive must be individually labelled/tagged with the Tenderer's Name and Tender Group.

Note 2: Separate envelopes and Flash Drives are to be submitted for each Tender Group.

ii Also to be included in the envelope is the **hard copy** of the completed form titled "**Summary of Tenders Enclosed**" which shall be forwarded with the tender documents.

iii. Tenders are to be deposited in the Tender Box labelled for that Category, in the Lobby and addressed to:

Administrative Officer IV – Procurement Unit
Ministry of Agriculture, Land and Fisheries
Corner Narsaloo Ramaya Marg Road and Soogrim Trace, Endeavour, Chaguanas

iv. Tenders must be submitted no later than the time and date specified in the Tender Notice.

3. COST OF BIDDING

The tenderer shall bear all costs associated with the preparation and submission of his bid and the Employer will in no case be responsible or liable for these costs regardless of the conduct or outcome of the tendering.

4. CONTENT OF TENDER DOCUMENTS

4.1 The set of tender documents issued for the purpose of soliciting tenders includes:

a) Instruction to Tenderers

b) Appendix to Tender

c) General Conditions of Contract,

d) Special Conditions of Contract

e) Form of Agreement,

f) Tender Forms/Scope of Works/Bill of Quantities

g) Specifications and Drawings, if any

h) Technical Information Package

4.2 The tenderer is expected to examine carefully all instructions, conditions, forms and terms. Failure to comply with the requirements of bid submission will be at the tenderers own risk.

5. TENDER CLARIFICATION and SITE VISIT

Tenderers are required to attend an Online Clarification Meeting and visit the site and ascertain the nature of the work to be done, means of access and egress, the availability and positions of essential services, viz, electricity, water etc. conditions of the site, necessity for and extent of sleeper roads, temporary crossing,

temporary drainage, working and space and storage for materials and allow in this tender for all such factors which may affect the execution of the work.

Attendance at Tender Clarification Meetings and Site Visits are Mandatory. Failure to attend either will result in disqualification and rejection of your bid.

6. AMENDMENT OF TENDER DOCUMENTS

6.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by the issuance of an Addendum.

6.2 The Addendum will be sent in writing, by letter or email to all prospective tenderers who have been issued the tender documents and will be binding upon them. Prospective tenderers shall promptly acknowledge receipt thereof by letter or email to the Employer.

6.3 In order to afford a prospective tenderer reasonable time in which to take an Addendum into account in preparing their bids, the Employer may, at his discretion, extend the deadline for the submission of bids.

7. PRICING/RATES TO BE INCLUSIVE

7.1 Prices inserted shall be deemed to include for the payment of customs and other duties, import levies and the like, for the provision of all labour, materials and plant, for transport, for deliveries to Site (where not specifically mentioned in the description) and for temporary storage of materials and for all other things necessary for the completion of the Works in accordance with bills of quantities and specification to the reasonable satisfaction of the Employer.

7.2 The rates inserted shall be deemed to be in Trinidad & Tobago currency.

8. CORRECTION OF TENDERS

8.1 Tenders determined substantially responsive will be checked by the Employer for any arithmetical errors in computation and summation. Errors will be corrected by the Employer as follows:

a) Where there is a discrepancy between the amounts in figures and in words in the tender form , the amount in words will govern, and

b) Where there is a discrepancy between the amounts in the tender form and the Bill of quantity , the amount in the Form of tender will govern, and

c) Where the unit rate against any item is not identified in the Bill of Quantity, the tender shall be rejected, and

d) If it is found on examination of a Tender there is any discrepancy as to the amount inserted in the bill of quantities and the amount arrived at by valuing the quantities set out at the rates set against, the corrected amount will govern.

e) Where corrections are made with respect to the total amount tendered, the Tenderer shall be directed to alter the total amount of his Tender to the amount so arrived at and if the Tenderer shall refuse to make such alteration; such tender shall be deemed to be rejected.

f) The Tenderer shall not alter or otherwise qualify the text of this Bill of Quantities. Any alterations or qualification made without the written approval of the Employer shall be ignored and the text of the bill of Quantities as printed shall be adhered to.

9. FLUCTUATIONS IN LABOUR AND MATERIALS

9.1 The Contract sum shall not be subject to adjustments for changes in market prices on materials and goods contained in the Bills of Quantities or for any items added thereto by the contractor when tendering or subsequently included by the Engineer.

9.2 The contract sum shall not be subject to adjustment for any wage increase from those applicable at the date of tender.

10. ACCEPTANCE

10.1 The Permanent Secretary reserves the right to reject any or all Tenders, without limiting the generality of the foregoing, **a tender will be summarily rejected if it is conditional, if it is incomplete; obscure or irregular; if it has erasures or corrections not initialed** in the Form of Tender and Bill of Quantities; or if it has unit rates that are obviously unbalanced.

10.2 The Permanent Secretary reserves the right to reject any Tender which does not provide satisfactory evidence that the Tenderer has the technical, physical and financial resources, to complete the works within the specific contract period.

10.3 The Permanent Secretary reserves the right to accept or reject any Tender, and to annul the Tendering process and reject tenders at any time prior to Award of Contract, without whereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for the action.

10.4 The Permanent Secretary may declare the Tendering void when none of the Tenders meet the intent of the Specifications or when it is evident that there has been a lack of competition and/or that there has been collusion. In addition, all Tenders may be rejected if they are substantially higher than the official budget approved by the employer.

10.5 The Employer does not bind itself to accept the lowest of any offer or to reimburse tenderers for any expenses incurred in tendering.

11. CANCELLATION OF TENDERS

The Government of the Republic of Trinidad and Tobago reserves the right to cancel the bidding process in its entirety or even partially without defraying any costs incurred by any firm.

12. TENDER VALIDITY

12.1 Tenderers must provide in their tender an assurance that prices will remain valid for an initial minimum period of ninety (90) days from the closing date of the tender.

12.2 In exceptional circumstances, prior to expiry of the original offer validity period, the Employer may request the tenderer for a specified extension in the period of validity. The request and responses thereto shall be made in writing.

13. COLLUSION

Each tenderer shall submit only one Tender. A tenderer who submits or participates in more than one Tender shall cause all tenders with their participation to be disqualified.

14. CLARIFICATIONS

14.1 Tenderers requiring a clarification of the tender documents must notify the Employer in writing, or email. All queries should be referred to

Administrative Officer IV (Procurement Unit)
Ministry of Agriculture, Land and Fisheries
Corner Narsaloo Ramaya Marg Road and Soogrim Trace, Endeavour,
Chaguanas Telephone No. 220-6253 Ext. 4252
Email: malf-procurement@gov.tt

14.2 Requests for clarification shall be raised not later than 12:00 noon five (5) days before the deadline for submission of tenders to permit the circularizing of the replies to all tenderers, but without identifying the source.

14.3 Such answers as are necessary shall be given as a matter of assistance to the tenderer but that shall not be construed as adding to, or taking away from, or otherwise altering the meaning and intent of the Tender, and/or the Tenderers' obligations there under, which can be varied only by letter signed by the Permanent Secretary, Ministry of Agriculture, Land and Fisheries.

15. DEADLINE FOR SUBMISSION OF TENDERS

Bids shall be delivered at the address specified not later than the date and time specified in the Invitation to Tender Letter.

16. LATE TENDERS

Any Tender received after the deadline prescribes in the Invitation Letter will be rejected and returned to the Tenderer.

17. EVALUATION PROCESS AND CRITERIA

17.1 Attendance at Clarification Meeting and Site Visits

Tenderers that did not attend the Clarification Meeting and the Site Visit shall be disqualified without further consideration.

17.2 Mandatory submissions

All submissions with omissions or invalidity with respect to the mandatory documents will be eliminated. Contractors should therefore pay particular attention to submitting the following:-

- Income Tax Certificate, Value Added Tax Clearance Certificate and NIB Certificate of Compliance dated not more than six (6) months prior to closing date of tender
- Firm's Certificate of Registration/ Certificate of Incorporation/ Notice of Directors
- Audited financial statement for at least one (1) year within the last three (3) year period

17.3 Financial Bid

a) The bids of only the Tenderers that have satisfied all the requirements as outlined in **17.1 and 17.2** above, would be considered for further evaluation

b) Contracts will normally be awarded to the lowest responsive bidder.

c) Where a tenderer is being considered for more than one contract, this tenderer must show that it has the Human, Equipment and Financial Resources to execute more than one contracts simultaneously.

17.4 Technical Evaluation

Tenderers that have been ranked as having qualifying tenders that fall within the five (5) lowest prices for the particular tender, shall be further evaluated based on their submissions in the Technical Information Package. To pass the Technical Evaluation, a tenderer must have attained at least 50% of the passing mark on each of the criteria and an overall 60% of the total marks.

17.5 Consideration of Past Performance

In evaluating bids, the past performance of contractors, for up to two (2) years prior to the close of tender, may be taken into consideration.

18. AGREEMENT

The successful tenderer will be required to enter into an agreement with the Permanent Secretary, Ministry of Agriculture, Land and Fisheries. The clauses in the draft Agreement contained herein with the Tender Documents shall be finalized prior to Contract Execution.

19. COMMENCEMENT OF WORK

The commencement of work shall be by the mutual agreement between the Permanent Secretary, Ministry of Agriculture, Land and Fisheries and the Contractor upon signing of the formal agreement.

20. INSURANCE OF VEHICLES AND EQUIPMENT

20.1 Only units which are insured in accordance with the laws of the Republic of Trinidad and Tobago must be used in the performance of this Contract. Evidence of insurance must be produced to the Ministry on demand. The use of uninsured units will be a breach of Contract justifying termination. The vehicles must also insure the passengers.

20.2 The contractor must submit to the Ministry within three (3) days after the expiry of the insurance of the vehicle, documentary evidence that the said Insurance Policy has been renewed.

APPENDIX TO TENDER

APPENDIX TO TENDER

ITEM	REVELANT-CLAUSE	DATA
Employer's Name and Address	G.1	Government of the Republic of Trinidad and Tobago.
Employer's Representative	G.1	Permanent Secretary, Ministry of Agriculture, Land and Fisheries Corner Narsaloo Ramaya Marg Road Endeavour and Soogrim Trace, Chaguanas
Engineer's Name and Address	G.1	Engineering Division Mausica Road Centeno
Time of Completion of the Work	G. 17	60 Days
Defects Liability Period	G.24	6 months
Electronic Transmission System		Email
Retention Percentage		10%
Works Delay Damages for Work	G. 20 & G. 21	$1,000.00 per day
Maximum Amount of Delay Damages		10% of Accepted Tender Sum
Minimum Amount of Interim Payment Certificate		Refer to Clause (H) Form of Agreement

Initials of signatory of Tender …… Date: ……

ITEM	REVELANT-CLAUSE	DATA
Periods for Submission of Insurance		
a) Evidence of Insurance	G. 8	14 days
b) Relevant Policies	G. 9 & G. 10	28 days
Minimum Amount of Third Party Insurance	G. 11	$1,000,000.00 per occurrence or 50% of contract sum. Whichever is greater.
Time for submission of work programme to Engineer	G. 13	7 days
Arbitrator (if agreed by both parties) arbitration	G. 34	Refer to ordinance law of
Arbitrator (if no agreement by parties)	G.34	Trinidad and Tobago

.

Initials of signatory of Tender …… Date: ……

GENERAL CONDITIONS OF CONTRACT

General Conditions of Contract

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GENERAL CONDITIONS OF CONTRACT

G1.
Definition and Interpretation

In the Contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires.

(a) **"Employer"** means Government of Trinidad and Tobago and includes the Employers successors and permitted assigns.

(b) **"Employer's Representative"** means the employee of Employer designated by Employer in writing to administer the Contract on behalf of Employer and as named in 'Appendix to tender'.

(c) **"Contractor"** means the person or persons, firm or company whose tender has been accepted by the Employer and includes the Contractors personal representatives, successors and permitted assigns.

(d) **"Engineer"** means the Engineer or any other Engineer appointed from time to time by the Employer's Representative and notified in writing to the Contractor to act as Engineer for the purposes of the Contract.

(e) **"Engineer's Representative"** means a person being the resident Engineer or assistant of the Engineer or Inspector of Works appointed from time to time by the Engineer and notified in writing to the Contractor by the Engineer to perform the functions set forth by the Engineer.

(f) **"Contract"** means the Agreement, Tender, Performance Bond General Conditions of Contract, Instruction to Tenderers, Standards and Specifications and Addenda (if any issued).

(g) **"Specification"** means the specification referred to in the Tender and any modification thereof or addition thereto as may from time to time be furnished or approved in writing by the Engineer.

(h) **"Tender Total"** means the total of the priced schedule in the Tender at the date of acceptance on the Contractor's Tender for the Works.

(i) **"Contract Price"** means the sum named in the "Notice of Award of Contract", subject to such additions thereto or deductions therefrom as may be made under the provisions hereinafter contained for the execution, completion and maintenance of the works in accordance with the Contract.

(j) **"Site"** means the lands and other places on, under, in or through which the Works are to be executed and any other lands or places provided by the Employer for the purposes of the Contract.

(k) **"Approved"** means approved in writing by the Engineer, including subsequent written confirmation or previous verbal approval.

(l) **"Days"** means calendar days unless specifically stated otherwise.

(m) **"Singular or plural"**. Works importing the singular also include the plural and vice versa where the context requires.

G2.
Engineer's Duties

The **Engineer** shall administer the Contract on behalf of the Employer's Representative and shall exercise general supervision and direction of the Works. He shall be responsible for the inspection and testing of the Works and the materials, the conduct of the Works, the compliance by Contract, the specification and all ordinances, regulations etc. affecting the works. The Engineer's staff shall include suitably qualified engineers and other technical personnel who are competent to carry out these duties.

The Engineer has authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of the Contract. He shall also have authority to reject all work and materials which do not conform to the Contract, to direct the application of

forces to any portion of the works, as in his judgment is required and to order the force increased or diminished and to decide questions which arise in the execution of the works.

The Engineer shall have the authority to issue change orders, the computation of quantities and certification of payments. He is authorized to revise the Specifications as may become necessary and to revise the design as may be required by changed conditions encountered in the field. He shall, however, obtain the concurrence of the Employer's Representative before instituting or approving major changes involving time delays or substantial increases in Contract Cost.

G3.
Engineer's Representative Duties

The duties of the **Engineer's Representative** are to watch and inspect the works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to relieve the Contractor of any of his duties or obligations under the Contract or, except as expressly provided thereunder, to order any work involving delay or any extra payment by the Employer, or to make any variation of or in the works.

The Engineer, from time to time, in writing, delegates to the Engineer's Representative such of the powers and authorities vested in the Engineer as may be necessary for the efficient execution of the works and shall furnish to the Contractor a copy of all such written elevations of power and authorities. Any written instruction or written approval given by the Engineer's Representatives to the Contractor within the terms of such delegations (but not otherwise) shall bind the Contractor and the Employer as though it had been given by the Engineer.

Provided always as follows:

(i) Failure of the Engineer's Representative to disapprove any work or materials shall not prejudice the power of the Engineer thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof.

(ii) If the Contractor shall be dissatisfied by reason of any decision of the Engineer's Representative, he shall be entitled to refer the matter to the Engineer who shall thereupon confirm, reverse or vary such decision.

G4.
Observance of Standards and Specification

The **contractor** is to carry out the works covered by this contract strictly in accordance with the relevant standards and specification and relevant drawings or as may be ordered by the Engineer.

G5.
Contractor's understanding of nature of work and type of equipment needed

(1) It is understood and agreed that the Contractor has, by careful examination, satisfied himself as to:

(a) the nature and location of the work,
(b) the conformation of the ground,
(c) the character, quality and quantity of materials to be encountered,
(d) the character of equipment and facilities needed preliminary to and during the execution of the works.
(e) The general and local conditions, and all other matters which can in any way affect the works under this Contract. No verbal agreement or conversation with any officer, agent and employee of the Employer, either before or after

	the execution of this Contract, shall affect or modify any of the terms or obligations contained in the Contract Documents.
Contractor satisfaction of tender price and rates	(2) The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his Tender for the works and of the rates and prices stated in the Schedule which rates and prices shall except, in so far as it is otherwise provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper execution, completion and maintenance of the works.
Claim for physical conditions and artificial obstruction other than climatic conditions	(3) If, however, during the execution of the works the **Contractor shall encounter physical conditions or artificial obstructions other than climatic conditions** on site, which in the opinion of the Engineer could not have been reasonably foreseen by an experienced Contractor and if the Contractor has given prompt notice in writing to the Engineer of an intention to claim for additional payment, the Engineer shall certify and the Employer shall pay such additional sum as may be claimed by the Contractor to cover the additional expenses which the Engineer has certified as expenses reasonably incurred. Immediately following the written notice given by the Contractor, the Contractor shall provide the Engineer with full details including daily records of all measurements taken in support of his intended claim. Receipt of the Contractor's written notice and details of his claim by the Engineer is not an indication of the acceptance of liability.
G6. **Retention fee**	The **Retention payment** shall be retained until the contract is completed to the satisfaction of the Employer and may be used to defray any expenditure in excess of the contract price which may be incurred by the Employer in the event of the contractor failing to carry out the contract satisfactorily. The retention percentage shall be as indicated in the 'Appendix to tender'
G7. **Time and requirement for entering into agreement and performance bond**	
Time for entering into agreement	(1) **Within seven (7) days of receiving notification from the employer** that the formal contract agreement has been prepared for the contract, the successful tenderer referred to in this contract as the "Contractor" must create a binding contract between the Employer and himself.
Performance bond	(2) Where specified in the "Appendix to tender" the contractor shall Pay to the employer or other authorized agency indicated in the appendix to tender, by cash or certified cheque a performance deposit of ten percent (10%) of the contract sum or alternatively provide a Bond in the same amount within seven (7) days of the date of the letter of award as a guarantee for the proper performance of the contract. The Performance Bond of the contractor will be retained until the contract is completed to the satisfaction of the Employer and may be used to defray any expenditure in excess of the contract price which may be incurred by the Employer in the event of the contractor failing to carry out the contract satisfactorily.

Release of performance bond	(3) This bond will be released upon satisfactory completion of the contract and at the expiration of the maintenance period.
G8. **Insurance by Contractor**	(1) Upon execution of the Agreement, the Contractor (but without limiting his obligations and responsibilities under Clause G10 hereof) shall **insure in the joint names** of the Contractor, Engineer and Employer against any damage, loss or injury which may occur to any property or to any person by or arising out of the execution of the Works or in carrying out of the Contract otherwise than due to the matters referred to in provision to Clause G10 (1) hereof. (2) The terms shall include a provision whereby, in the event of any claim in respect of which the contractor would be entitled to receive indemnity under the policy being brought or made against the Employer, the insurer will indemnify the Employer against such claims and any costs, charges and expense in respect thereof.
G9. **Insurance for loss or damage from whatever cause**	(1) Without limiting his obligations and responsibilities under Clause G43 hereof, the Contractor shall, upon execution of Agreement, insure, in the joint names of the Employer, Engineer and the Contractor, against all loss or damage from whatever cause arising (other than 'Force majeure") for which he is responsible under the terms of the Contract and in such manner that the Employer, Engineer and Contractor are covered during the period of the works and for any loss or damage occasioned by the Contractor in the course of any operations carried out by him for the purpose of complying with his obligations hereof:- (a) The works to the full value of such works executed from time to time. (b) The materials and other things brought on to the Site by the Contractor to full value of such materials and other things. (2) Such insurance shall be effected with an insurer and in terms approved by the Employer and the Contractor shall produce, to the Engineer, the policy or policies of insurance and the receipts for payment of the current premiums. The contractor shall execute this at his own cost.
G10. **Indemnification of employer against loses, injury……..**	(1) The Contractor shall (except if and so far as the Specification provide otherwise) indemnify and keep indemnified the Employer against all losses and claims for injuries or damage to any person or property whatsoever (including surface or other damage to land being or crops being on the Site suffered by tenants or occupiers) which may arise out of or in consequence of the execution and maintenance of the Works and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto. Provided always that nothing herein contained shall be deemed to render compensation or damages for or with respect to:- (a) The permanent use or occupation of land by the works or any part thereof or (save as hereinafter provided) surface or other damage as aforesaid. (b) The right of the Employer to execute the Works or any part thereof on, over, under, in or through any land. (c) Interference, whether temporary or permanent, with any right or light, airway or water or other easement or quasi-easement which is the unavoidable result of the execution of the Works I accordance with the contract.

	Provided further that for the purpose of this Clause, the expressions "the Site" shall be deemed to be limited to the area defined in the Specifications or shown on the Drawings in which lands and crops will be disturbed or damaged as an inevitable consequence of the carrying out of the Works.
G11. Indemnification of employee and effect insurance for such	1. The Employer shall not be liable for or in respect of any damage or compensation under the compensation for injuries and Workmen's Compensation or any statutory re-enactment extension or modification of these Ordinances or any Common Law or in consequence of any accident or injury to any workman or other person whether in the employment of the Contractor or of any Sub-Contractor and the Contractor shall indemnify and keep indemnified the employer against all such damages or compensation and against all claims, demands, proceedings, costs charges and expenses whatsoever in respect thereof or in relation thereto. 2. The Contractor shall effect a policy of insurance against all liability to pay damages or compensation as aforesaid in respect of all workmen and other persons who may be employed on the Works with a company approved by the Employer (which approval shall not be unreasonably withheld). He shall continue such insurance during the whole of the time that any persons are employed by him on the Works and shall produce to the Engineer such policy of insurance and the receipt for payment of the current premium. Provided always that in respect of any persons employed by the Sub-Contractor, the Contractor's obligation to effect a policy of insurance as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have effected such a policy of insurance in respect of such persons, but the Contractor shall require such sub-contractor to produce to the Engineer such policy of insurance and the receipt for payment of the current premium.
G11.B Value of Insurance	The Contractor shall execute at his own cost all insurance referred in Clause G8, G9, G10 and G11 hereof or any other insurance which he may be required to effect under the terms of the contract, then and in such case the Employer may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from any time to time deduct the amount so paid by the Employer, as aforesaid, from any monies due to or which may become due to the Contractor or recover the same as a debt due from the Contractor. The insurance shall be for the duration of the contract inclusive of the maintenance period.
G12. Consequence of failure to effect	If the Contractor shall fail to effect and keep in force the Insurance referred to in Clause G8, G9, G10 and G11 hereof or any other Insurance which he may be required to effect under the terms of the Contract, then and in any such case the Employer may effect and keep in force any such

insurance by contractor	insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Employer, as aforesaid, from any monies due to or which may become due to the Contractor or recover the same as a debt due from the Contractor.
G13. Submission of work programme for approval	1. Within seven (7) days after acceptance of his Tender, the Contractor shall submit to the Engineer for his approval a program showing the order of procedure in which he proposes to carry out the works and a general description of the arrangements which the Contractor proposes to adopt for the execution works and thereafter shall furnish such further details and information as the Engineer may reasonably require in regard thereto.
Form of Work Programme	2. The programme shall be in the form acceptable to the Engineer. No work shall commence on the Contract until the Contractor's programme, in the form acceptable, has been received and accepted by the Engineer. The submission to and approval by the Engineer of a programme or the furnishing of particulars shall not relieve the Contractor of any of his duties or responsibilities under the Contract.
Information Required in Work	3. The Contractor's programme shall provide the following basic information for maintaining the rate of progress and completion of the work in all respect within the times stipulated in the Agreement. a) The Contractor's analysis of the essential components of the Contract. b) The Contractor's analysis of the sequential relationship of each of the components. c) The Contractor's estimate of the resources allocation and time required for completion of each of these components. d) Such other information as may be required to prepare a network by the Critical Path Method (CPM). e) The details of all salient job features including construction activities, procurement of materials, testing, traffic diversions, etc. f) A network programme, CPM or PERT. The network shall reflect resources allocation. g) A series of bar graphs of major items showing the expected rate of completion of each item or group. The anticipate rate of progress, in percent, of each item or group shall be shown for ever two-week interval until the completion of the works.
G14. Material to be used by the contractor	Within seven (7) days of receiving notification of the award of contract, the successful tenders referred to in this contract as the "contractor" must submit a detailed laboratory test report of the materials to be used on each road layer for approval by the Engineer. Only laboratories approved by the Highways Division, Ministry of Works and Transport shall be used. Only materials that are in conformity with the specification given in the relevant Standard Specification will be accepted. Delays

incurred in obtaining the samples or permission to start with shall not prejudice the time to commence work by the contractor.

G15. **Time to start work**	The contractor must start work on the contract within three (3) days of a written order to proceed to be issued by the Engineer.

G16.
Termination of the contract

G16.1
Termination of the contract by the Employer

The Employer shall be entitled to terminate the contract if the contractor:

a) Fails to comply with Clause 7 [time for entering into agreement and performance bond)]
b) Abandons the Works, or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
c) Without reasonable excuse fails:
   (i) To proceed with the Works in accordance with Clause 15 [Time to start works] or,
   (ii) To comply with a notice issued under Clause 53 [Rejection and Remedial Work], within 7 days after receiving it.
d) Subcontracts the whole of the Works or assigns the Contract without the required agreement.
e) Becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
f) Gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:
   (i) For doing or forbearing to do any action in relation to the Contract, or
   (ii) For showing or forbearing to show favour or disfavour to any person in relation to the Contract,

   Or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person such inducement or reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

In any of these events or circumstances, the Employer may, upon giving 7 days' notice to the Contractor, terminate the Contract and expel the Contractor from the site. However, in the case of sub-paragraph (e) or (f). The Employer may by notice terminate the Contract immediately.

The Employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After termination, the Employer may complete the Works and/or arrange for any other entities to do so. The Employer and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor.

The Employer shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

As soon as practicable after a notice of termination under Clause 16.1 [Termination by Employer] has taken effect, the Engineer shall proceed to determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

After a notice of termination under Clause 16.1 [Termination by Employer] has taken effect, the Employer may:

a) Withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established, and/or
b) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3[Evaluation at Date of Termination]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

	The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 14 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and shall be paid in accordance with Sub-Clause 16.4 [Optional Termination, Payment and Release].
G16.2. Termination of the contract by the Contractor	The Contractor shall be entitled to terminate the Contract if: a) The Engineer fails, within 90 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate, b) The Contractor does not receive the amount due under an Interim Payment Certificate within 90 days after the expiry of the time stated in Sub-Clause 23 [Payment] within which payment is to be made (except for deductions with respect to the Employer's Claims). c) The Employer substantially fails to perform his obligations under the Contract, d) The employer fails to comply with Clause 7 [time for entering into agreement and performance bond)] A prolonged suspension affects the whole of the Works as described in Clause 56 [Suspension], or e) The Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events. In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of sub-paragraph (d) or (e, the Contractor may by notice terminate the Contract immediately. The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

G16.3 Cessation of work and removal of equipment	After a notice of termination under sub Clause 16.1 [Termination by the employer], sub Clause 16.2 [Termination by Contractor] or Clause 44 (Force Majeure) has taken effect, the Contractor shall promptly: a) Cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works, b) Hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and c) Remove all other Goods from the Site, except as necessary for safety, and leave the Site.
G16.4 Payment on termination	After a notice of termination under Sub-Clause 16.2 [Termination by Contractor] has taken effect, the Employer shall promptly: a) Return the Performance Security if any to the Contractor, b) Pay the Contractor in accordance with Sub-Clause 44.6 [Optional Termination, Payment and Release], and c) Pay to the Contractor the amount of any loss of profit or other loss or damage sustained by the Contractor as a result of this termination.
G17. Time for completion of the work	Subject to any requirement in the Contract as to the completion of any section of the Works before completion of the whole, the whole of the Works shall be completed (duly maintaining the rate of progress indicated in the Agreement) within the time stated in the 'Special Conditions of Contract', calculated from the date of the Engineer's written "Notice to Proceed" or such extended time as may be allowed under Clause G18 hereof.
G18. Extension of time	Should the amount of extra or additional work or other special circumstance which may occur, other than through a default of the Contractor, be such as fairly to entitle the Contractor to an extension of time for the completion of the Works, the Engineer shall determine the amount of such extension. Provided that the Engineer is not bound to take into account any extra or additional work or other special circumstance unless the Contractor has within five (5) days after such work has commenced or such circumstances have arisen, notified the Engineer in writing of his intention to file or claim for extension of time. As soon thereafter as is practicable, the Contractor shall deliver to the Engineer full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated.

G19.
Steps to be taken when work is not in accordance with approved schedule

(1) Should the rate of progress of the Works or any part thereof be, at any time, in the opinion of the Engineer, not in accordance with the approved progress schedule and/or too slow to ensure the completion of the Works by the prescribed time or extended time for completion of the Works, the Engineer shall notify the Contractor in writing and the Contractor shall thereupon take steps as the Engineer may think necessary to expedite progress so as to complete the Works by the prescribed time or extended time for completion.

The Engineer has the right to order the Contractor to employ more men and to increase his plant, and the Contractor shall forthwith comply with these orders. The Contractor shall not be entitled to any additional payment for taking such steps.

G19.2
Approval for work on nights, weekends and public holiday

(2) If, as a result of any notice given by the Engineer under sub-clause (1) of this Clause, the Contractor shall seek the Engineer's permission to do any work at night or on Sundays or on Saturdays or on Public Holidays, such permission shall not be unreasonable refused.

(3) All such night or Sundays or Saturdays or Public Holidays work shall be carried out without unreasonable noise and disturbance. The Contractor shall indemnify the Employer from and against any liability for damages on account of noise and other disturbances created while or in carrying out the Works and from and against all claims, demands, proceedings, costs and expenses whatsoever in regard or in relation to such liability.

Work done after sunset shall be lighted adequately by lights mounted on towers or tripods or by other means that will illuminate the Works. The use of automobile or truck headlights will not be considered satisfactory. Equipment used for excavating, hauling, placing and compacting shall be equipped with sufficient light to give effective illumination. The Engineer shall be the sole judge of adequate or effective illumination. Where preparations are not made prior to dusk for adequate or effective illumination, night work will not be permitted. Works in progress at night without adequate and effective lighting will be stopped and the Contractor shall make no claim for any delay or loss resulting therefrom.

G20.
Payment of liquidated damages

(1) If the Contractor shall fail to achieve the rate of progress and/or to complete the Works within the time prescribed by Clause G17 hereof or extended time, then the Contractor shall pay to the Employer a maximum of up to the sum of 10% of the contract price as liquidated damages for such default. The Employer may, without

prejudice to any other method of recovery, deduct the amount of such damages from any monies in his hands, due or which may become due to the Contractor. The payment or deduction of such damages shall not relieve the Contractor from his obligations to complete the Works or from any other of his obligations and liabilities under the Contract.

(2) If before the completion of the whole of the Works, any part of the Works has been certified by the Engineer as completed pursuant to Clause G25 hereof and occupied or used by the Employer, the liquidated damages for delay shall for any period of delay after such certification be reduced in the proportion which the value of the part so certified bears to the value of the whole of the Works.

(3) The contractor must complete the work within the completion period specified by him in his tender or such extended period as may be approved by the Employer. Should he fail to do so, he will **be liable to pay liquidated damages at the rate of one thousand dollars ($1,000.00) per day** for each day in excess of the original or extended completion time the work remains unfinished

G21. Measurement of works

The Works shall be measured, and valued for payment, in accordance with this Clause.

Whenever the Engineer requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:

(a) promptly either attend or send another qualified representative to assist the Engineer in making the measurement, and
(b) supply any particulars requested by the Engineer.

If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.

Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

If the Contractor examines and disagrees with the records, and/or does not sign them as agreed, then the Contractor shall give notice to the

Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them. If the contractor does not so give notice to the Engineer within 3 days after being requested to examine the records, they shall be accepted as accurate.

Except as otherwise stated in the Contract and notwithstanding local practice:

(a) measurement shall be made of the net actual quantity of each item of the Permanent Works, and
(b) the method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

G22. Payment to Contractor

(1) The Contractor will be paid at intervals on work certified complete by the Engineer. The Engineer shall, based on actual measurements and levels, prepare the detailed bill (in the standard form prescribed for the purpose) for the quantities of the Permanent Works executed by the Contractor since the last certificate as per the Agreement and shall certify the amount due to the Contractor on account of their estimated contract value;

(2) The Engineer shall as soon as possible after measurement of the Works prepare and deliver his certificates for payment to the Employer.

(3) Payment upon each of the Engineer's certificate shall be made by the Employer within ninety (90) days after such certificate has been delivered to the Employer by the Engineer.

(4) Upon completion of the Works, the Engineer will make final inspection expeditiously and notify the Contractor of acceptance. Such final acceptance, however, shall not preclude or stop the Engineer from correcting any measurement, estimate or certificate made before or after completion of the Works, nor shall the Engineer be precluded or stopped from recovering from the Contractor or his surety, or both, such over-payment as the Employer may have sustained by failure on the part of the Contractor to fulfil his obligation under the Contract. A waiver on the part of the Engineer of a breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor without prejudice to the terms of the Contract shall be liable to the Employer for defects; fraud or such gross mistakes as may amount to fraud.

(5) Whenever under the Contract any sum of money shall be recoverable from or payable by the Contractor, such sum may be deducted from or reduced by the amount of any sum or sums then due or which at any time thereafter may become due to the Contractor under the Contract or any other contract with the Employer.

G23.
Payment

The Employer will make payment to the Contractor on account of the contract as specified in the contract agreement on work satisfactorily completed, as confirmed by the Engineer. Payments will be made only on contracts for which all activities have been completed and accepted.

G24.
Maintenance Period

The contractor shall guarantee the workmanship of the work actually completed in accordance with the standard specification for the period stated in the Appendix to tender, calculated from the date stated in the completion certificate as the completion of the contract. The employer shall not release the retention payment unless the maintenance period has expired.

G25.
Steps to be taken on completion of work

1. As soon as, in the opinion of the Engineer, the Works shall have been substantially completed and shall have passed any final test that may be prescribed by the Contract, the Engineer shall issue an itemized list of incomplete and unsatisfactory items. Upon the completion and/or correction of such items, the Engineer will issue a Certificate of Completion and the Contractor's Period of Maintenance for the Works shall commence as of the date of such certificate of completion.

   Provided that the Engineer may give such certificate with respect to any part of the Works before the completion of the whole of the Works and shall give such certificate with respect to any substantial part of the Works which has been both completed to the satisfaction of the Engineer and occupied or used by the Employer. When any such certificates are given in respect of a part of the Works, such part shall be considered complete and the Period of Maintenance of such part shall commence from the date of such certificate. The payment of the retention shall only become due upon the expiration of the maintenance period of the entire contract.

2. The Employer shall have the right from time to time or at any time before the completion of the Works to take possession of and use any part or parts of the Site or of uncompleted Works and in such case the Contractor shall completely finish the said uncompleted part or parts of the work as and when the Engineer shall direct whether before or after the respective prescribed time or extended time or times (if any) for the completion of the Works and if required by the Engineer while

	the Employer is in possession of the said part or parts of the Site or of the Works. Provided always that if such possession or occupation or use by the Employer interferes, in the opinion of the Engineer, with the completion of the said part or parts of the Works generally due allowance shall be made by the Engineer by way of extension of time under the provisions of Clause G18 hereof and he may exclude such part or parts of the Works from the provision as to time as he may think reasonable for the completion of the said part or parts. Should the Contractor be involved in extra expense by reason of the operation of this sub-clause; the amount of such expenses duly certified by the Engineer shall be paid to the Contractor by the Employer.
G26. **Certification of completed work**	The contract shall not be considered completed until the Engineer has certified that the work has been done to his satisfaction and issue a Certificate of Completion to the Contractor at the end of the Maintenance Period.
G27. **Calculation of maintenance period**	1. The Contractor shall, for the period stated in the 'Appendix to tender' (referred to in these Conditions as the Period of Maintenance) calculated from the date of completion of the Works certified by the Engineer in accordance with Clause G25 (1) hereof (or in the event of more than one certificate having been issued by the Engineer in accordance with the said Clause, from the respective dates so certified) maintain the Works in such a manner that at expiration of the Period of Maintenance they shall be in as good and perfect order, repair and condition (fair wear and tear excepted) as that which they were at the commencement of the Period of Maintenance. The Contractor shall, at the expiration of such period, deliver the Works in a condition satisfactory to the Engineer.
Repair and rectification of defects	2. The Contractor shall, at his own cost, repair rectify and make good to the satisfaction of the Engineer, all defects, imperfections, shrinkage and other faults arising from or out of the use of materials or workmanship which may appear, arise or become manifest during the retention periods. The Engineer shall give the Contractor written notice during the Period of Maintenance concerning those defects and if the Contractor shall fail to repair, rectify and make good as aforesaid, the Employer may execute the necessary work by his own workmen or by other agencies and recover the cost of the same plus certain percentage charges as determined by the Engineer towards expenses involved in the supervision and administration of the Works from monies due or that may become due to the Contractor or from the forfeiture of the Performance Bonds provided always that:

(a) If the Contractor shall be required to carry out any work or repair, rectification or making good which he is not expressly liable to do at his own cost under the provisions of this Clause, the value of such work shall be ascertained and paid to the Contractor as it were additional work.

(b) The Employer shall indemnify the Contractor against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any use of the Works by others, always providing that the Contractor shall be liable for damage to the Works, or for damages or injury to any persons or property in consequence of materials or workmanship not in accordance with the Drawings or Specifications, or failure of the Contractor to comply with any obligations or requirements of Contract Documents.

G28.
Assignment of works

The Contractor **shall not** assign the Contract or any part thereof or any benefit or interest therein or thereunder without the written consent of the Employer.

G29.
Subletting

Except where otherwise provided by the Contract, the **Contractor shall not sub-let any part of the work without the written consent of the Engineer** and such consent, if given shall not relieve the Contractor from any liability or obligations under the Contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor or his agents, servant or workmen. Provided always that the execution of any part of the work on a piecework basis shall not be deemed to be sub-letting thereof.

Upon written consent of the Engineer, the Contractor will be permitted to sub-let parts of the works but must perform with his own company or organization, work valued at not less than sixty percent (60%) of the total Agreed Tender Price, except that the cost of any items designated as "Specialty Items" will be deducted from the total price before computing the amount of work that must be performed by the Contractor with his own forces. The "Specialty Items" are defined and listed in the 'Special Conditions of Contract'. The contractor shall be responsible for the observance of the stipulation of this contract by any permitted sub-contractor.

G30.
Variations of work

(1) The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if for any other reason it shall, in his opinion, be desirable, shall have power to order the Contractor to do and the Contractor shall do any of the following:-

a) Increase or decrease the quantity of any work included in the Agreement,

b) Omit any such work,
c) Change the character or quality or kind of any such work,
d) Change the levels, lines, position and dimensions of any part of the Works, and
e) Execute additional work of any kind necessary for the completion of the Works and no such variation shall in any way vitiate or invalidate the Contract, but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contract Price. Any claim for extension of time cause thereby shall be adjusted at the time of ordering such variation.

(2) **No such variations shall be made by the Contractor without an order in writing of the Engineer**. Provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of any order given under this Clause but is the result of the quantities exceeding or being less than those stated in the Agreement. **Provided also that if for any reasons, the Engineer shall consider it desirable to give any such order verbally, the Contractors shall comply with such order and confirmation in writing of such verbal order given by the Engineer**, whether before or after carrying out of the order, shall be deemed to be an order in writing within the meaning of this Clause. All confirmations shall not be unreasonably delayed by the Engineer.

(3) The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.
The proposal shall be prepared at the cost of the Contractor.
If a proposal which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

a) The Contractor shall design this part,
b) If this change results in a reduction in the contract value of this part, the Engineer shall determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:

(i) Such reduction in contract value, resulting from the change, excluding adjustments
(ii) The reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall not be a fee.

G31. Variation of the contract sum and payment for such variation

1. The Engineer shall determine the amount, if any, to be added to or deducted from the sum named in the Agreement in respect of any extra or additional work done or work omitted by his order. All such work shall be valued at the rates set out in the Agreement if, in the opinion of the Engineer, the same shall be applicable. If the Agreement does not contain any rates applicable to the extra or additional work, reasonable rates shall be fixed by the Engineer.

2. Provided that, if the nature or amount of any omission or addition relative to the nature or amount of the whole of the Works or to any part thereof shall be such that, in the opinion of the Engineer, the rate or price contained in the Agreement for any item of the Works is by reason of such omission or addition rendered unreasonable or inapplicable, the Engineer shall fix such other rate or price as, in the circumstances, he shall think reasonable and proper.
   Provided also that no increase of the Agreement Amount under sub-clause (1) of this Clause, or variation of rate or price under this sub-clause (2) of this Clause shall be made unless, as soon after the date of the order as is practicable, and, in the case of extra or additional work before the commencement of the work or as soon thereafter as is practicable, notice shall have been given in writing:-
   (a) By the Contractor to the Engineer of his intention to claim extra payment or a varied rate; or
   (b) By the Engineer to the Contractor of his intention to vary a rate or price as the case may be.

3. When the accepted quantities of work vary from the quantities in the Agreement, the Contractor shall accept as payment in full insofar as Agreement unit rate items are concerned, payment on the following basis:-
   (a) If the total pay quantity of any item of work, which has a total value of five percent or more of the total Contract Price, varies from the Agreement quantity thereof by twenty five percent or less, payment for the item of work will be made at the original Agreement unit rate. If the total pay quantity of such an item of work varies from the

   Agreement quantity by more than twenty-five percent, such items shall be eligible for negotiation of rate adjustment.

   Adjusted unit rates will be applicable only to that portion of the overrun or under-run which differs by twenty-five percent from the original Agreement quantity.

   An adjustment as determined by the Engineer will be made to credit the Employer with any reduction in cost or to compensate

the Contractor for any increase in cost resulting from such change in quantity.

(b) Payment for any item of work which has a final total value of less than five percent of the total Contract Price will be made at the original Agreement unit rate regardless of increased or decreased quantities.

(c) The Engineer may order omitted from the work any items or portions of the work found unnecessary to the improvement and such omission shall not operate as a waiver of any conditions of the Contract or invalidate any of the provisions thereof, or shall the Contractor have any claim for anticipated profit.

(d) Except as specified herein, no allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities or from unbalanced allocation, among the contract items or overhead expense on the part of the Contractor and subsequent loss of expected reimbursement therefore, or from any other cause.

4.

(a) The Engineer may, if, in his opinion, it is necessary or desirable, order that any additional or substituted work be executed on a day work basis.

The day work shall be carried out only on the written instructions of the Engineer and the Contractor shall then be paid for such work under the stipulations and at the rates set out thereunder. These rates shall only apply when the Engineer is of the opinion that the rates in the Agreement are inapplicable.

b) The payment for labour shall be for the actual hours worked at the basic wage set out in the 'Special Condition of Contract' which shall exclude allowances and employees benefits. To such basic wage, the Contractor shall be allowed to charge a percentage addition to cover allowances, employees' benefits, profits, overhead charges, supervision, subsistence, temporary scaffolding, staging, checking, light, insurance, transportation, small tools and other operational and incidental items. This percentage addition will be inserted in the Tender by the Tenderer at the time of tendering and no further increase will be admitted on any grounds or cause whatsoever.

c) The payment for materials delivered on the Site shall be the net cost of materials including transportation costs to the Site as listed out in the 'Special Condition of Contract'. Payment for materials not listed shall be the net cost of materials (less discounts) paid by the Contractor plus the actual transportation cost incurred by him. The Contractor shall furnish to the Engineer such receipts or vouchers as evidence to prove the amounts so paid and before ordering materials, the Contractor shall submit to the Engineer quotations for the same and obtain his approval. To such net cost, the Contractor will be allowed to charge a percentage addition to cover overheads, supervision, handling, profits, insurance and other incidental items. This percentage addition will be inserted in the Tender by the Tenderer at the time of tendering and no further increase will be admitted on any grounds or cause whatsoever.

d) Payment for Plant shall be at the rates set out in the 'Special Condition of Contract'. Payment shall be made for actual "operating time" only. "Standing time" and "brake-down periods" shall not be paid for. Rates for Plant shall include for wages of all drivers, operators, attendants etc., all fuel, oil and other consumable items, maintenance, transportation etc. To such rate, the Contractor will be allowed to charge a percentage addition to cover overheads, supervision, profits and other incidental items. This percentage addition will be inserted in the Tender by the Tenderer at the time of tendering and no further increase will be admitted on any grounds or cause whatsoever.

e) In respect of all work executed on a day work basis, the Contractor shall during the continuance of such work deliver each day to the Engineer an exact list in duplicate of the names, occupation and time of all workmen employed on such work and a statement also in duplicate showing the description and quantity of all materials and plant used thereon and therefore. One copy of each list and statement will, if correct, be signed by the Engineer and returned to the Contractor. At the end of each month the Contractor shall deliver to the Engineer a priced statement of the labour material and plant (except as aforesaid) used and the Contractor shall not be entitled to any payment unless such list and statements have been fully and punctually rendered. Provided always that, if the Engineer shall consider that for any reason the sending of such list and statements by the Contractor in accordance with the forgoing provision was impracticable, he shall nevertheless be entitled to authorize payment for such work either as day work (on being satisfied

as to the time employed and materials and plant used on such work) or at such value therefor as he shall consider fair and reasonable.

5. The Contractor shall send to the Engineer every two (2) weeks from the date of commencement of the contract a written account giving full and detailed particulars of all claims for additional expense to which the Contractor may consider himself entitled and of all extra and additional work ordered by the Engineer which he has executed during the preceding month and no claim for payment for any such work or expense will be considered which has not been included in such particulars. Provide always that the Engineer shall be entitled to authorize payment to be made for any such work or expense, notwithstanding the Contractor's failure to comply with this condition, if the Contractor has, within two (2) days of the happening of the events giving rise to the claim, notified the Engineer in writing that he intends to make a claim for such work or expense.

G32.
Language

The language in which the Contract Documents are drawn up is English and the Contract is to be construed and interpreted in English.

G33
Settlement of disputes of meaning of Terms & Conditions

In case of any dispute arising between the contractor and any officer of the Employer to the intention or meaning of any of the terms and conditions of this contract, such matter must be referred to an arbitrator to be agreed upon between the parties or, failing agreement, to be nominated on the application of either party by the President for the time being of the Association of Professional Engineers of Trinidad and Tobago and any such reference shall be deemed to be a submission to arbitration within the meaning of the Arbitration Ordinance or any statutory re-enactment or amendment thereof for the time being in force.

G34.
Settlement of disputes

1. If any dispute of any kind whatsoever shall arise between the Employer or the Engineer and the Contractor in connection with or arising out of the Contract or the carrying out of the Works (whether during the progress of the Works or after their completion and whether before or after the termination, abandonment or breach of the Contract) it shall in the first place be referred to and settled by the Engineer who shall promptly state his decision in writing and give notice of the same to the Employer and the Contractor. Save as hereinafter provided such decision in respect of every matter so referred shall be final and binding upon the Employer and the Contractor until the completion of the Works and shall forthwith be given effect to by the Contractor, who shall proceed with the Works

	with all due diligence whether or not he or the employer requests arbitration as provided. 2. If the Contractor be dissatisfied with any such decision of the Engineer then and in any such case the Contractor shall within seven (7) days after receiving notice of such decision appeal such decision in writing to the Employer's Representative who shall review the dispute and state his decision in writing and give notice of the same to the Contractor and the Engineer within seven (7) days after receipt of such appeal from the Contractor. 3. If the Contractor be dissatisfied with any such decision of the Employer's Representative upon appeal then, in any such case, the Contractor may within seven (7) days after receiving notice of such decision require that the matter shall be referred to an arbitrator to be agreed upon between the parties or failing agreement, to follow the procedure described in the Arbitration Ordinance Law of the Republic of Trinidad and Tobago. 4. Such arbitrator shall have full power to open up, review and revise any decision, opinion, direction, certificate or valuation of the Engineer and neither party shall be limited in the proceeding before such arbitrator to the evidence or arguments put before the Employer's Representative for the purpose of obtaining his decision above referred to. The Award of the Arbitrator shall be final and binding on the parties.
G35. **Content of Contract Document**	The Contract Documents, cover with explicit provisions, all matters relating to the works which the Contractor undertakes to execute, complete and maintain, providing all labor, materials and everything, whether of temporary or permanent nature, in full compliance with such provisions or reasonably to be inferred from them.
G36. **Settlement of ambiguities or discrepancy of**	The several documents forming the Contract are to be taken as mutually explanatory of one another and in case of ambiguities or discrepancy; the same shall be explained and adjusted by the Engineer who shall thereupon issue to the Contractor instructions, in writing, thereon. Provided always that if, in the opinion of the Engineer, compliance with any such instruction shall involve the Contractor in any expense which by reason of any such ambiguity or discrepancy the Contractor did not and had reason not to anticipate, the Engineer shall certify and the Employer shall pay any such additional sum as may be reasonable to cover such expense.
G37. **Ownership and custody of contract document**	All Standards, Specifications and any other Contract Documents are the property of the Employer and shall remain in the sole custody of the Engineer. They are not to be used on other work.

G38
Further instruction required by contractor

The Contractor shall give adequate notice, in writing, to the Engineer for any further specifications or orders, including directions, instructions or approval that may be required for the execution of the works under the Contract. The notice shall include details of the specifications or orders required and of why and by when it is required and of any delay or disruption likely to be suffered if it is late. If, by reason or any failure or inability of the Engineer to issue within a time reasonable in all the circumstances any such specifications or orders requested by the Contractor; the Contractors suffers delay and or incurs costs then the Engineer shall take such delay into account in determining any extension of time which the Contractor is entitled and the Contractor shall be paid the amount of such costs as shall be reasonable.

G39.
Work satisfaction and adherence

1. Save in so far as it is legally or physically impossible, the Contractor shall execute , complete and maintain the works in strict accordance with the Contract to the satisfaction of the Engineer, and shall comply with an adhere strictly to the Engineer's instruction and directions or any matter therewith, whether mentioned in the Contract or not.
2. The materials used in the work under this Contract shall be the best of their several kinds, suitable for the service required and subject to the approval of the Engineer.
3. The workmanship shall be of the best quality and shall be subject to the approval of the Engineer as equal to the best standard practice. All work shall be neatly finished. The Contractor shall take instructions and directions only from the Engineer or (subject to the limitations referred to in Clause G3 hereof) from the Engineer's Representative.

G40.
Approval of superintendent

1. The Contractor shall give or provide all necessary superintendents during the execution of the works and as long thereafter as the Engineer may consider necessary. The Contractor or a competent authorized agent or representative approve of, in writing by the Engineer (which approval may at any time be withdrawn) is to be constantly on the works and shall give his whole time to the superintendent of the same.

Replacement of superintendent

2. It such approval shall be withdrawn by the Engineer, the contractor shall as soon as is practicable (having regard to the requirements of replacing him as herein after mentioned) after receiving written notice of such withdrawal remove the agent from the site and shall not thereafter employ him again on the Site in any capacity and shall replace him by another agent approved by the Engineer.

Receiving of instruction by superintendent	3. Such authorized agent or representative shall receive on behalf of the Contractor directions and instructions from the Engineer or (subject to the limitations of Clause G3 hereof) the Engineer's Representative.
G41. Maintenance of competent staff and removal of staff by order of Engineer	The Contractor shall employ in and about the execution and maintenance of the works only such persons as are careful, skilled and experienced in their several trades and callings and the Engineer shall be at liberty to object to and require the Contractor to remove from the works any person employed by the Contractor in or about the execution and maintenance of the works who, in the opinion of the Engineer, misconduct himself or is incompetent or negligent in the proper performance of his duties and such persons shall not be again employed upon the works without the permission of the Engineer.
G42 Protection of public	The Contractor shall be responsible for the protection of the public in and about the area of the works and wherever else his operations are being conducted. He shall comply with all statutory requirements and make good safety deficiencies as directed by the Engineer. The Contractor shall provide guards, barricades, fencing, lighting, watching and all else necessary as a subsidiary obligation and no direct payment will be made therefore.
G43. Contractors responsibility to take care of wok	1. From the commencement to the completion of the works, the Contractor shall take full responsibility for the care thereof; and in case any damage, loss or injury shall happen to the works or to any part thereof from any cause whatsoever (save and except under Clause 44 (Force Majeure) shall, at his own cost, repair and make good the same so that, at completion, the works shall be in good order and condition and in conformity, in every respect, with the requirements of the Contract and the Engineer's instructions. In the event of any such damage, loss or injury happening from any of the excepted risks, the Contractor shall, if and to the extent required by the Engineer repair and make good the same as aforesaid at the cost of the Employer. The Contractor shall also be liable for any damage to the works occasioned by him in the course of any operations carried out by him for the purposes of complying with his obligations under Clause G27 hereof.
Preservation of property and property works	2. The Contractor shall be responsible for the preservation of all private and public property and shall protect carefully from disturbance or damage all land monuments and property marks until the Engineer has witnessed or otherwise referenced their location and shall not move them until directed.

		When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the work or in consequence of non-execution thereof by the Contractor, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding or otherwise restoring as may be directed by the Engineer. He shall make good such damage or injury in an acceptable manner. Failure of contractor to make good the said damages or injury, the Engineer will deduct all expenses incurred in making good same from the contract sum.
Protection of utilities	3.	The Contractor shall satisfy himself as to the exact locations of utility lines and shall protect and support in a suitable manner all utilities encountered in his excavating and trenching operations. The Contractor shall make good any damage to these lines caused by his operations. If the nature of the damage is such as to endanger the satisfactory operation of the utilities and the necessary repairs are not made immediately by the Contractor under the direction and supervision of the respective utilities, the work may be done by the respective owners or agents and the cost thereof charged against the Contractor.
Employers right to let other contract/contractors in area of the work	4.	The Employer reserves the right to let other contracts in the area of the works. Whenever work being done by the Employer's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer, to secure the completion of the various portions of the work in general harmony. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs. If any part of the Contractor's work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. His failure so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to the defects which may develop in the other Contractor's work after the execution of his work. To insure the proper execution of his subsequent work, the Contractor shall measure work already in place and shall at once report to the Engineer any discrepancy.
Compliance with the law: **OSHA Act 2004**	5.	The contractor shall comply in every respect with all applicable lease, regulations and building and construction codes of the Republic of Trinidad and Tobago. Particular attention should be paid to the Occupational Safety and Health Act 2004(6).

First aid requirements	6.	The Contractor shall provide such equipment and facilities as are necessary or required, in case of accidents, for first aid service to any who may be injured in the progress of work, and he shall have standard arrangements with local hospitals for the removal and hospital treatment of any employee who may be injured or who may become ill.
Reporting of accident to the Engineer and other authorities	7.	The Contractor shall, within twenty four (24) hours of the occurrence of any accident at or about the Site or in connection with the execution of the works, report such accident to the Engineer. The Contractor shall also report such accident to the competent authority whenever such report is required by law.

G44.
Force Majeure

G44.1
Definition of Force Majeure

In this Clause, "Force majeure" means an exceptional event or circumstance:

a) Which is beyond a Party's control,
b) Which such Party could not reasonably have provided against before entering into the Contract,
c) Which, having arisen, such Party could not reasonably have avoided or overcome, and
d) Which is not substantially attributable to the other Party.

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

(i) War, hostilities (whether war be declared or not), invasion, act of foreign enemies,
(ii) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war,
(iii) Riot, commotion, disorder, strike or lockout by persons other than the contractor's Personnel and other employees of the Contractor and Sub-contractors,
(iv) Munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and
(v) Natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

G44.2
Notice of force majeure

If a party is or will be prevented from performing any of its obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented.

	The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstances constituting Force Majeure. The Party shall, having given notice, be excused performance of such obligations for so long as such force Majeure prevents it from performing them. Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.
G44.3 **Duty to Minimise Delay**	Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure. A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.
G44.4 **Consequences of Force Majeure**	If the Contractor is prevented from performing any of his obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 44.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to : a) An extension of time for any such delay, if completion is or will be delayed, under Clause 18 [Extension of Time], and b) If the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 44.1 [Definition of Force Majeure] and, in the case of sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost.
G44.5 **Force Majeure Affecting Subcontractor**	If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.
G44.6 **Optional Termination, Payment and Release**	If the execution of substantially all the Works in progress is prevented for a continuous period of 28 days by reason of Force Majeure of which notice has been given under Sub-Clause 44.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given,

and the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment].

Upon such termination, the Engineer shall determine the value of the work done and issue a Payment Certificate which shall include:

a) The amounts payable for any work carried out for which a price is stated in the Contract;
b) The Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
c) Any other Cost of liability which in the circumstances was reasonable incurred by the Contractor in the expectation of completing the Works
d) The Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and
e) The Cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination.

G44.7 Release from Performance under the Law

Notwithstanding any other provision of the Clause, if any event or circumstances outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil it's or their contractual obligations or which, under the law, governing the Contract, then upon notice by either Party to the other Party of such event or circumstance;

a) The Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
b) The sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-Clause 44.6 [*Optional Termination*, *Payment and Release*] if the Contract had been terminated under Sub-Clause 44.6.

G45.

Indemnification of employer by contractor

1.

a) All operations of the Contractor necessary for the execution of the Works shall, so far as compliance with the requirements of the Contract permits, be carried on so as not to interfere unnecessarily or improperly with the convenience of the public, or the access to, use and occupation of the public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.

b) The Contractor shall save harmless and indemnify the Employer in respect of all claims, proceedings, damages, costs, charges, expenses whatsoever arising out of, or in relation to, any such matters in so far as the Contractor is responsible therefore.

Maintenance of traffic

2.

a) The proper maintenance of continuous traffic adjacent to and in the vicinity of the Works is of extreme importance. The Contractor is required to liaise with the traffic authorities and submit to the Engineer any detour Engineer before restricting the flow of traffic.

Removal of dirt or other material that interfere with drainage and traffic

b) The Contractor shall provide for prompt removal of all dirt and other materials spilled from his or his sub-contractor's trucks on existing public or private highways over which such materials are hauled or onto which such materials are washed or otherwise deposited by reason of his work whenever the accumulation is sufficient to cause dust or the formation of mud so as to interfere with drainage or create a traffic hazard.

Dust control operations

c) Whenever the operations on the Works cause traffic or the Contractor's equipment to create dusty conditions, the Contractor shall take steps, including applying water, furnishing and spreading calcium chloride or using other adequate methods subject to the approval of the Engineer, to prevent or mitigate, to the maximum extent possible, all dust, dirt, fine sand etc. resulting directly or indirectly from the Contractor's operations. The Contractor's attention is called to the fact that dust control may be an hour to hour operation in order to satisfy his obligations under the dust control requirement.

Roads used by the contractor

d) All roads used by the Contractor shall be maintained by the Contractor and left satisfactory to the Engineer.

e) Payment for maintenance of existing roadways and traffic as provided above will not be made under any specific item, but the cost thereof shall be considered a subsidiary obligation under this Contract and no direct payment will be made therefore.

G46. **Cost for maintenance of existing roadway**	1. The Contractor shall, except where otherwise provided, be responsible for all claims, demands, proceedings, damages or injury to highways and bridges caused by extraordinary traffic arising out of each intersection of the Works; and he shall make good all such damage or injury to the entire satisfaction of the Authority or Authorities having the control and maintenance of such highways and bridges, providing that, if such Authority or Authorities shall prefer to make good the same time themselves, the Contractor shall be responsible for so much of the cost so incurred as may be referable to extraordinary traffic arising out of the execution of the Works. The Contractor shall indemnify and save harmless the Employer from and against all claims which may be brought or made against the Employer and from and against all demands, proceedings, damages, costs charges and expenses whatsoever arising there out of or in connection therewith. 2. All roads used by the Contractor for transportation of equipment and materials shall be maintained in a condition equal to existing conditions prior to this Contract by the Contractor at his own expense.
G47. **Contractor to keep site free of obstructions**	1. During the progress of the Works the Contractor shall keep the Site reasonably free from all unnecessary obstruction and shall or dispose of any surplus materials and clear away and remove from the Site any wreckage rubbish or Temporary Works no longer required. 2. On completion of the Works, the Contractor shall clear away and remove from the site all surplus materials, rubbish and Temporary Works of every kind and leave the whole of the Site and Works clear and in a workmanlike condition to the satisfaction of the Engineer.
G48 **Contractor responsible for his servants negligence**	The Contractor shall be responsible for the negligence on the part of his servants which may result in injury to persons or damage to materials, the property of the Employer or any member of the public. The cost of the damage or injury so done, to property or persons shall be deducted from any monies due to the contractor or otherwise recovered from him.
G49. **All vehicles used by contractor must be licensed & insured**	Only vehicles which have been licensed and insured for the contract period are to be used in the performance of this contract. The use of unlicensed and uninsured vehicles will be a breach of contract.

G50.
Quality of material supplied

If the specifications required the contractor to supply materials for the contract, such materials must not be inferior in quality to any accepted sample and must be acceptable to the Employer.

Rejected material

Rejected materials must be removed from the site by the contractor at the time of delivery failing which the Employer may arrange for their removal at the expense of the contractor.

The contractor must identify the source of materials to be used on the contract. Samples must be provided on request from the Engineer.

G51.
Inspection of equipment

The Employer may arrange for the equipment to be or being used by a contractor on a project to be examined and the Contractor must afford the Employer adequate facilities for the examination and must replace any equipment which is deemed by the Employer as unacceptable.

G52.
Material testing

1. All materials and workmanship shall be of the respective kinds described in the Specification and in accordance with the Engineer's instructions and shall be subjected from time to time to such tests as the Engineer may direct at the place of manufacture or fabrication or on the Site or at all or any such places specified by the Engineer. The Contractor shall provide such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used and shall supply samples of materials before incorporation in the Works for testing as may be selected and required by the Engineer. Samples of all materials that the Contractor proposes to use on the Works, shall be submitted by the Contractor and the Engineers approval obtained, before commencement of work. One set of such approved samples in sealed transparent containers shall be exhibited in the Contractor's field office.

2. All samples that may be required by the Engineer for testing or any other purpose shall be supplied by the Contractor at his own cost, unless otherwise specified in the Contract.

3. The cost of making all tests required by the Engineer shall be borne by the Contractor unless otherwise specified in the Contract.

G53.
Rejection and remedial works

1. The Engineer shall during the progress of the Works have power to order in writing from time to time.
    a) The removal from the Site, within such time or times as may be specified in the order, of any materials which, in the

opinion of the Engineer, are not in accordance with the Contract.

b) The substitution of proper and suitable materials, and

c) The removal and proper re-execution, notwithstanding any previous test thereof or interim payment therefor, of any work which in respect of materials or workmanship is not, in the opinion of the Engineer, in accordance with the Contract.

2. In case of default on the part of the Contractor in carrying out such order, the Employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be recoverable from the Contractor by the Employer, or may be deducted by the Employer from any monies due or which may become due to the Contractor.

3.

a) Neither observations by the Engineer nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the work in accordance with the requirements of the Contract.

b) Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is not discovered, nor shall it obligate the Engineer for final acceptance.

G54.

Rates and wages

The Contractor shall pay rates of wages that are not less favourable than:

1.

a) The rates of wages established under any collective agreement between employers or employers' association and organization representative respectively of substantial proportions of employers and workers engaged in the trade of industry, whether or not the Contractor is a party to such agreement.

b) The rates established in the absence of or subsequent to any collective agreement, under any arbitration award for work of the same character in the trade or industry, whether or not such award is binding on the Contractor.

c) The minimum rates of wages established by any law.

d) Such rates of wages as per paid by Government for work of the same character in the trade or industry, in the absence of any collective agreement, arbitration award or provision of law.

Notice of rate of pay to workers

2. The Contractor or sub-contractors shall post notices in conspicuous Places at the establishments and work-places concerned informing the workers of the rates of pay and other conditions of work.

Record of rates and wages

3. The Contractor or his sub-contractors shall keep wages and time books and, in the event of work being paid for by results, work sheets

shall be kept showing wages paid to, the time and/or the amount of work performed by workmen in and about the execution of the contract, and the Contractor or his sub-contractors shall be bound whenever required to produce such wages and time books and/or work sheets for the inspection of any person authorized by the Government.

Notification of workers by contractors

4. The contractor shall, before commencing work under the Contract notify the employer's representative of the following:
    a) The number and categories of workers he proposes to employ;
    b) Their rates of pay;
    c) The date of commencement of the work; and
    d) The addresses of the workers he proposes to employ.

Limitations

5.
    a) The contractor shall be prohibited from transferring or assigning directly or indirectly to any person or persons whatever, any part of his contract without the written permissions of a person authorized by the Government.
    b) The contractor shall be responsible for the observance of these stipulations of this contract by any permitted sub-contractor.

Freedom of workers to join trade union

6. The Contractor shall recognize the freedom of his workers to be members of registered trade unions.

Deputies

7. In the event of any question arising as to whether the requirements of these stipulations of this contract are being observed that question shall, if not otherwise dispose of, be referred to an arbitrator to be agreed upon between the parties or, failing agreement, to be nominated on the application of either party by the President for the time being of the Association of Professional Engineers of Trinidad and Tobago and any such reference shall be deemed to be a submission to arbitration within the meaning of the Arbitration Ordinance or any statutory re-enactment or amendment thereof for the time being in force.

8. Any contractor or sub-contractor who is found to be in breach of these stipulations of this contract shall cease to be approved as a contractor or sub-contractor for such period as the Government may decide.

G55.
Increase in rates

The contractor will not be granted any increase in the contract rates based on an Increase in the price of goods, labour or any other input to the works, retroactive or otherwise.

G56.
Suspension of work by Engineer

1. The Contractor shall, on the written order of the Engineer, suspend the progress of the Works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of the Engineer. The extra cost incurred by the Contractor in giving effect to the Engineer's instructions under this Clause shall be borne and paid by the Employer unless such suspension is:
    a) Otherwise provided for in the Contract, or
    b) Necessary by reason of some default on the part of the Contractor, or
    c) Necessary by reason of weather conditions on the Site, or
    d) Necessary for the proper execution of the Works or for safety of the Works or any part thereof insofar as necessity does not arise from any act or default by the Engineer or the Employer or from any of the excepted risks defined in Clause G44 (2) hereof.

    Provided that the Contractor shall not be entitled to recover any such extra cost unless he gives written notice of his intention to claim to the Engineer within twenty-eight days of the Engineer's order. The Engineer shall settle and determine such extra payment and/or extension of time under Clause G18 hereof to be made to the Contractor in respect of such claim as shall, in the opinion of the Engineer, be fair and reasonable.

2. If the progress of the Works or any part thereof is suspended on the written order of the Engineer and if permission to resume work is not given by the Engineer within a period of twenty-eight days from the date of suspension then, unless such suspension is within paragraph (a), (b), (c) or (d) of sub-clause (1) of this Clause, the Contractor may serve a written notice on the Engineer requiring permission within twenty-eight days from the receipt thereof to proceed with the Works, or that part thereof in regard to which progress is suspended and, if such permission is not granted within that time, the Contractor by a further written notice so served may, but is not bound to, elect or treat the suspension where it effects part only of the Works as an omission of such part under Clause G31 hereof, or where it affects the whole Works, as an abandonment of the Contract by the Employer.

G57.
Quantities are estimated

The quantities stated in the Agreement are the estimated quantities of the work. They are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfilment of his obligation under the Contract. The Engineer shall, except as otherwise stated herein, ascertain and determine by measurement the value, in accordance with the contract of work done.

G58. Inspection and testing by the Engineer	1. The Engineer and any person authorised by him shall at all times access to the Workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the Works and the Contractor shall afford every facility and the every assistance in obtaining the right to such access. 2. The Contractor shall give the Engineer timely notice to readiness of the work for all inspections, tests and approvals. If any such work required so to be inspected, tested or approved is covered without such written notice to the Engineer, it must, if requested by the Engineer, be uncovered for observation and such uncovering shall be at the Contractor's expense. 3. No work shall be covered up or put out of view without the approval of the Engineer and the Contractor shall afford full opportunity for the Engineer to examine and measure any work which is about to be covered up or put out of the view and to examine foundations before permanent work is placed thereon. The Contractor shall give due notice to the Engineer whenever any such work or foundations is ready or is about to be ready for examination and the Engineer shall, without unreasonable delay, unless he considers it unnecessary and advises the contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundations. 4. The Contractor shall uncover any part of the works or make openings in or through the same as the Engineer may from time to time direct and shall reinstate and make good such part or parts to the satisfaction of the Engineer. If any such part or parts have been covered up or put out of view after compliance with the requirements of sub-clause (3) of this Clause and are found to be executed in accordance with the Contract, the expense of uncovering, marking openings in or thorough, reinstating and making good the same, shall be borne by the Employer, but in any other case, all such expenses shall be borne by the Contractor.
G59. Provisional Sum	The term "Provisional Sum" shall mean a sum provided for work or for costs which cannot be entirely foreseen, defined, or detailed at the time the tendering documents. Provisional sums shall be used in part or in whole as directed by the Engineer. In the event that the provisional sum is not used the contractor shall not claim or be entitled to loss of profit as a result of such. For each provisional sum the Engineer may instruct: (a) That the contractor make Payment for the supply of the Engineer's implementation resources such as, but not limited to, monitoring staff, transportation for staff, telecommunications and training. Payment to the contractor shall be the actual

	amount paid (or to be paid) by the contractor plus a sum for overhead charges and profit, calculated at ten (10) percent of these actual amounts. This is referred to as 'client reimbursable' in the 'bills of quantities'. (b) Work to be executed (including plant, materials and services) by the contractor and valued under clauses 30(variations of Work) or at reasonable rates to be negotiated between the contractor and the engineer. (c) Work to be executed (including plant, materials and services) by a sub-contractor selected by the Engineer. Payment to the contractor shall be the actual amount paid (or to be paid) to the selected subcontractor plus a sum for overhead charges and profit, calculated at ten (10) percent of these actual amounts.
G 60. Contingency	The term "Contingency" shall mean a percentage provided for work or for costs which cannot be entirely foreseen, defined, or detailed at the time of preparing the tendering documents. Contingency shall be used in part or whole as directed by the Engineer. In the event the Contingency is not used, the contractor shall not claim loss of profit or be entitled to the contingency sum.

SPECIAL CONDITIONS OF CONTRACT

CONTENTS

(Special Conditions of Contract to accompany the Tender)

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S1. 1 THE EMPLOYER PROVIDING ACCESS TO THE SITE

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the Appendix to Tender. The right and possession is not exclusive to the Contractor. The rights of access of approved users and stakeholders of the Site shall be maintained throughout the duration of the Works. A register of approved users and stakeholders of the Site shall be provided by the Engineer in writing within five (5) days of the Commencement Date. The Engineer is entitled to amend this register as may be required. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification.

S1. 2 SECURITY OF THE SITE

The Contractor shall comply with all regulations and directions made by the Employer or the Engineer from time to time with regard to the security of the Site. The Contractor shall be responsible for keeping unauthorized persons off the Site, and assist the Employer and other sub-contractors in doing the same. Authorized persons shall be limited to the Contractor's Personnel, the Employer's Personnel, other sub-contractors' personnel and any other personnel notified to the Contractor, by the Employer or the Engineer. The Employer and the Engineer shall not be responsible for the security of the Contractor's Equipment or any Goods brought on the Site by the Contractor.

During the execution of the Works, the Contractor shall keep the Site free from all un-necessary obstruction, and shall store and dispose of any Contractor's equipment or surplus materials in the area so designated by the Engineer. The Contractor shall be responsible for and shall upon the request of the Engineer clear away and remove from the Site all wreckage, rubbish and temporary Works. The Contractor shall leave that part of the Site and the works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such goods as required for the Contractor to fulfil obligations under the Contract.

The Contractor shall obtain the approval of the Engineer for the proposed siting of all spoil heaps, temporary roads, rail and sleeper tracks, paths, hard standings, sheds and other structures.

S1. 3 CONTRACTOR'S OBLIGATIONS IN RESPECT OF OCCUPATIONAL HEALTH SAFETY AND ENVIRONMENTAL REQUIREMENTS

The Contractor will implement an HSE Management system in compliance with the Occupational Safety & Health Act 2004, as amended in 2006 and in and general conditions for the Works that will include risk assessment, management responsibility, training, provision of PPE, substance abuse testing and incident reporting. The Contractor shall pay particular attention in terms of HSE Management to the following

- Segregation of plant and people
- Equipment usage (certification, competence of operators, load certification of lifting equipment);
- Documentation – use of current drawings, establishment of control points;
- Temporary works;
- Competent operator personnel
- Daily Work Report

The Contractor shall provide temporary sanitary arrangements and accommodation for his staff and employees, in accordance with the requirements of the act and shall exercise control to prevent any nuisance or contravention of any specific directions of the Ministry of Health or the Employer's Representative in connection therewith.

Adequate toilet and clean water washing facilities shall be provided. Siting of any temporary facilities shall be approved in writing by the Employer's Representative All standard regulations and any emergency regulations, which May be issued from time to time in connection with Sanitation and/or Public Health, shall be observed by the Contractor.

The Contractor shall not dispose of any surplus material in private land, unless authorized by the owner in writing, authenticated before a Notary Public, and with previous authorization of the Engineer. The Contractor shall take all precautionary

measures, throughout the duration of the project, aimed at preventing the contamination of rivers, water courses, lakes and lagoons, Pollutant wastes, such as chemical products, fuel, lubricants, sewerage water, paints, silt and any other obnoxious material shall not be discharged onto seas, rivers, water courses, lakes, lagoons, or drainage channels leading to the foregoing.

S1. 4 ENGAGEMENT OF STAFF AND LABOUR

The Contract shall employ a minimum of seventy-five percent (75%) of unskilled labour and twenty-five percent (25%) of semi-skilled and skilled labour from within the El Reposo community and environs. It is the responsibility of the Contractor to ensure that any labour employed from within the El Reposo community and environs are adequately qualified or experience to undertake the work assigned to the standards herein defined

S 1. 5 TIME FOR THE COMPLETION OF WORKS

The time allowed for completion of the works is as shown in Table S1

Contract No.	Project Name	Estimated Duration/Days
CAU22/23-PLER01	Refurbishment of Praedial Larceny Squad Facility El Reposo	60 days

Table S1

S1. 6 ACCIDENTS

The Contractor shall within 24 hours of the occurrence of any accident at or about the site or in connection with the execution of the Works report such accident to the Employer's Representative. The Contractor shall also report such accident to the competent authority whenever such report is required by law.

S1.7 CORRUPT OR FRADULENT PRACTICES

If the Employer determines that the Contractor has engaged in corrupt or fraudulent practices, in competing for or in executing the Contract, the Employer may, after given 14 days' notice to the Contractor, terminate the Contract. For the purpose of this Clause: "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in the Contract execution fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a Contract to the detriment of the Employer, and includes collusive practice among Tenderers (prior to and after Tender) designed to establish tender prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

S1.8 DRAINAGE AND RIVER CHANNELS

It may be necessary to construct some structures in ground water. No additional payment will be made for such conditions but the cost thereof shall be included in the price bid for the various items of the Contract.

The Contractor's attention is directed to the fact that he may be required to make alterations to several existing drainage channels. Temporary drainage facilities May be required but the Contractor shall in no way obstruct the proper functioning of the drainage systems. Prior approval shall be obtained from the Employer's Representative in advance of the start of the operations for the Contractor's proposals for any alterations to drainage systems and temporary drainage structures and should the Contractor wish to place false work in a drainage or river channel. The Contractor May be required to break into certain drainage structures for the installation of the new drainage system.

No specific payment will be made for this work, but the cost thereof shall be included in the prices bid for the various Contract items.

It will be the responsibility of the Contractor to provide adequate temporary drainage throughout this Contract until such time as new drainage facilities are completed. All proposed drainage diversions must be submitted to the Employer's Representative for his approval.

S1.9 CO-ORDINATION OF WORK WITH OTHERS

The Contractor's attention is directed to the fact that he may be required to coordinate his operations with work being performed or to be performed on other Contracts in the area of the Works, with work of sub-contractors, utility companies and others as may be required. In particular, he will be required to co-operate when utilities are being installed.

A number of utilities must necessarily be relocated during the course of the Contract, and due allowance must be made for this in the scheduling of work.

The right is reserved by the Employer's Representative to do work by other contractors or by Government forces and to permit public utilities, companies and others to do work during the progress and within the limits of or adjacent to the Works.

The Contractor shall conduct his work and cooperate with such other parties so as to cause as little interference as possible with such other work as may be progressing at the same time.

In the case of a difference of opinion as to the respective rights of the various parties involved or an of interference between the operations of different Contractors, the Engineer shall be the sole judge of the rights of each Contractor in respect of the entire project and in all cases his decision shall be accepted as final and no cause for claim.

S1.10 PRIVATE LAND PERMIT

The Contractor shall not dispose of any surplus material in private land, unless authorized by the owner in writing, authenticated before a Notary Public, and with previous authorization of the Engineer.

S1.11 WATER POLLUTION

The Contractor shall take all precautionary measures, throughout the duration of the project, aimed at preventing the contamination of seas, rivers, water courses, lakes and lagoons, Pollutant wastes, such as chemical products, fuel lubricants, sewerage water, paints, silt and any other obnoxious material shall not be discharged onto rivers, water courses, lakes lagoons, or drainage channels leading to the foregoing.

S1.12 COVID-19 - Safety Protocols and Procedures

Before the initiation of works on the contract, the Contractor shall submit a formal, written COVID-19 prevention plan to the Engineer. The plan shall focus on reducing exposure and transmission of the Covid-19 virus, inclusive of all protocols and detailed procedures for the following:

i) Personal health awareness
ii) Hand sanitizing- Effectiveness and frequency
iii) Masking
iv) Social distancing- Maintenance of appropriate spacing.
v) Cleaning of the workspaces, tools and machinery
vi) Work planning to maximize social distancing
vii) Workplace health screening (temperature checking stations)
viii) Personal protective equipment
ix) Management of visitors to the site.

The contractor shall designate a site specific Covid-19 supervisor to enforce Covid-19 response practices on the Job site and perform regular site inspections.

FORM OF AGREEMENT

FORM OF AGREEMENT

TRINIDAD AND TOBAGO

THIS AGREEMENT (hereinafter together with all Appendices attached hereto and forming an integral part hereof called "**the Agreement**") is made in duplicate this……. day of……in the year of Our Lord Two Thousand and Twenty Three between Permanent Secretary in the Ministry of Agriculture, Land and Fisheries, Cor. Narsaloo Ramaya Marg Road and Soogrim Trace, Endeavour, Chaguanas acting herein for and on behalf of the Government of the Republic of Trinidad and Tobago which expression shall mean and include the officer or officers for the time being carrying out the duties of Permanent Secretary in the said Ministry (hereinafter referred to as "**the Employer**") of the One Part and a company duly registered under the laws of Trinidad and Tobago and having its registered office in the Island of Trinidad (hereinafter referred to as "**the Contractor**") of the Other Part.

WHEREAS

(A) The Employer is desirous that certain works be carried out under the Central Administration Unit, namely for and on behalf of the Ministry of Agriculture, Land and Fisheries, (hereinafter referred to as "**the Works**") and that the Works be executed in accordance with the terms of this Agreement and the documents annexed hereto.

(B) The Contractor was invited to tender for the performance of the Works by Letter of Invitation to tender dated the (hereinafter referred to as **"Invitation to Tender"**) hereto annexed and marked "**A**".

(C) The Contractor offered to execute the Works at and for the total price or sum of which sum includes Value Added Tax as evidenced by its Tender dated the and the Bills of Quantities dated the (hereinafter referred to as "**the Tender Form**" and "**the Bills of Quantities**" respectively) hereto annexed and marked "**B**" and "**C"** respectively.

(D) By Letter of Award dated the (hereinafter referred to as "**the Letter of Award**") hereto annexed and marked "**D**" the Contractor was informed that the Employer had accepted its Tender to execute and complete the Works and had agreed to award the contract for the Works to the Contractor at the price or sum of (hereinafter referred to as **"the Contract Sum**") plus Value Added Tax in the sum of or such other sum as may be payable in accordance with the terms and conditions of this Agreement.

(E) The Contractor has agreed to abide by the General Conditions of Contract, Special Conditions of Contract, Standard Specifications and Drawings for the Works (herein after referred to and together called "**the Conditions of Contract**") hereto annexed in a bundle and marked "**E**".

(F) Prior to the execution of this Agreement the Contractor visited and examined the site of the Works and satisfied itself as to the nature of the same and of the physical and climatic conditions obtaining insofar as they affect the Works and execution of the same and satisfied itself as to where and in what manner the labour and materials required for the Works could be obtained and as to all matters which might have influenced it in making its tender and made every allowance it considered desirable in its own judgment in view of the information.

(G) Copies of the Contract Documents annexed hereto have been signed by the Contractor and the Employer for the purpose of identifying them as same, which together with these presents are descriptive of the extent and character of the Works.

(H) Payment claims may be processed on completion of:

- 30% of works by value
- 60% of works by value
- 100% of works by value

NOW THEREFORE IT IS AGREED as follows:

1. In this Agreement words and expressions shall have the same meaning as are respectively assigned to them in the Contract Documents.

2. (a) The Contract Documents shall comprise the following documents which shall be deemed to form and to be read and construed as part of this Agreement.

(i) The **Invitation to Tender** dated the hereto annexed and marked "**A**".

(ii) The **Tender Form** dated the hereto annexed and marked "**B**".

(iii) The **Bill of Quantities** dated the hereto annexed and marked "**C**".

(iv) The **Letter of Award** of the Contract dated the hereto annexed and marked "**D**".

(v) The **Conditions of Contract** hereto annexed in a bundle and marked "**E**".

(b) In the event of any inconsistency or conflict between this Agreement and any other document hereinabove referred to, the provisions of this Agreement will take precedence.

3. The Contractor shall at all times and for all intents and purposes under this Agreement be an Independent Contractor and is not an Agent, Employee or Servant of the Government of the Republic of Trinidad and Tobago.

4. The Employer hereby engages the Contractor to execute and complete the Works and the Contractor hereby agrees to execute and complete same in conformity with the terms and effect of this Agreement and with the Contract Documents hereinabove referred to.

5. In consideration of the execution and completion of the Works by the Contractor as aforesaid the Employer hereby covenants to pay to the Contractor the Contract Sum of plus Value Added Tax in the sum of in accordance with the Letter of Award or such other sum as may become payable hereunder at the time and in the manner set out in the Contract Documents.

6. (a) The Ministry shall have the absolute right to abandon the Works or to amend its project or to change the general basis for the execution of the Works at any time and such action on its part shall in no event be deemed to be a breach of contract.

(b) The Ministry, in its sole discretion and for any reason whatsoever, shall also have the absolute right to terminate this Agreement and such action on its part shall in no event be deemed to be a breach of contract.

(c) In the event of such termination, the Ministry shall make payment to the Contractor for any portion of the Contract satisfactorily performed prior to the effective date of termination.

7. The Contractor for himself and his assigns and the Employer mutually covenant that they will respectively perform and observe the several provisions of the contract to be performed and observed by them respectively as set out in the Conditions of Contract hereinbefore referred to.

8. The Permanent Secretary in the Ministry of Agriculture, Land and Fisheries shall not be personally liable for anything arising out of this Agreement.

IN WITNESS WHEREOF the Permanent Secretary in the Ministry of Agriculture, Land and Fisheries, for and on behalf of the Government of Trinidad and Tobago has hereunto set her hand the……. day of…….2023 and…….. has hereunto set his hand the…… day of …….. 2023.

SIGNED by)
Permanent Secretary)
in the Ministry of Agriculture, Land and
Fisheries for and behalf of the Government) _____
of the Republic of Trinidad and Tobago)
in the presence of: -)

THE COMMON SEAL OF
)
was hereunto affixed by)

its Secretary in the presence of)

)_____

one of its Directors by Order and Authority of the)
Board of Directors in conformity with the By-Laws of)
The Company in the presence of: -)

TENDER NAME:

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD FACILITY EL REPOSO

TENDER NO.: CAU22/23-PLER01

INTRODUCTION

SCOPE OF WORKS

TENDER FORM

PREAMBLE TO BILL OF QUANTITIES

BILL OF QUANTITIES

Table of Contents

Bill of Quantities

Refurbishment of Praedial Larceny Squad Facility
El Reposo

Tender No.: CAU22/23-PLER01

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Scope of Works	BOQ 2
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Preamble to Bill of Quantities	BOQ 5 – 7
Bill of Quantities	BOQ 8 - 19

INTRODUCTION

The Ministry of Agriculture, Land and Fisheries, Head Office Central Administration Unit is desirous of executing works at the Praedial Larceny Facility in El Reposo, Sangre Grande.

The project name and associated contract number is as follows:

Contract No.	Project Name
CAU22/23-PLER01	Refurbishment of Praedial Larceny Squad Facility El Reposo

A brief scope of works for the works is outlined in the following pages.

Tender No. CAU22/23-PLER01

SCOPE OF WORKS

The Site

These works relate to Contract No. CAU22/23-PLER01. The site of the work is at the El Reposo Demonstration Station in the county of St. Andrew, on the island of Trinidad.

The Works

The Works entails the refurbishment of the Praedial Larceny building.

A brief description of the activities involved are as follows:

1. Preliminary Works including careful removal of windows, doors, and roofing.
2. Roof works.
3. Tiling and ceiling installations.
4. Construction of a strong room and provision of weapons storage.
5. Plumbing works including toilets, showers.
6. Construction of a tank plinth, pump house and the installation of a water pump.
7. Electrical works including installation of light fixtures.
8. Provision of Doors, Windows.
9. Painting of building.
10. Construction of concrete paved car park.

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TENDER FORM

Ministry of Agriculture, Land and Fisheries
Head Office
Central Administration Unit

Tender No. CAU22/23-PLER01

Tender Name: Refurbishment of Praedial Larceny Squad Facility
El Reposo

The Permanent Secretary
Ministry of Agriculture, Land and Fisheries
Corner Narsaloo Ramaya Marg Road and Soogrim Trace, Endeavour,
Chaguanas

Madam,

1. Having examined the Tender Documents for the execution of the above- named Works and having also inspected the site of the Works, we, the undersigned, offer to perform the said Works in full conformity with the said Tender Documents for the sum of

_____

(*Amount stated in words*)

_____

_____ (TT) VAT Inclusive

$_____ (VAT Inclusive)
(Numerals)

2. We acknowledge that the Appendix to Tender forms part our Tender.

3. We undertake, if our Tender is accepted, to commence the Works within three (3) working days after the receipt of the Engineer's Notice to Commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Tender.

4. We agree to abide by this tender for the period of ninety (90) days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

5. Unless or until a formal Agreement is prepared and executed, this Tender together with your acceptance thereof, shall constitute a binding contract between us.

6. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this _____day of_____ 20_____

Signature_____

_____in capacity of _____
(Name in Block Letters) ***(Designation)***

Duly authorized to sign tender for and on behalf of_____

.

(Tenderer Name in Block Letters)

Tenderer Address: _____

Tenderer Stamp: _____

Contact No._____ ***(Office)*** ***Fax No.*** _____

_____ ***(Mobile)*** ***Email Address*** _____

Witness: ……..

Address: ……..

.....

……..

Occupation: ……

PREAMBLE TO BILLS OF QUANTITIES

The following Preambles define the methods which will be used for the re-measurement of the Works. The Tenderer is to include within the rates and prices in the Bills of Quantities, for all the work both temporary and permanent in order to complete the Contract as shown on the Drawings or as detailed in the Specification, whether or not it is described in the Bills of Quantities or in the Preambles thereto. The Tenderer shall enter his prices under the columns in the Bills of Quantities in Trinidad and Tobago Dollars.

1. The Bills of Quantities herein, including all notes and instructions, form an integral part of the Contract Documents. However, the descriptions contained in the Bills of Quantities for each item are not necessarily complete. The Contractor is referred to the Conditions of Contract and other Documents, Specifications and Drawings as well as relevant Standards and Codes of Practice for further information as no claim or variation will be considered on account of the Contractor's failure so to do.

2. The Contractor is cautioned to familiarise himself with the full content of other sections of the Contract Documents including the Drawings and Specifications (or any other information that can be reasonably inferred from any of them) and all obligations contained in the documents shall be included in the Tender prices, even if specific items relating to them are not listed in these Bills of Quantities.

3. The Contractor will be held to have familiarised himself with all site conditions, all survey and site investigation records available, means of access and the location of existing services, in order to execute the works measured and described within the Bills of Quantities. No claim for want of knowledge in this respect will be considered.

4. The Contractor's unit rates are to be the fully inclusive value of the work described and must include all related work, accessory or consumable material, incidental labour, supervision, administration, tools construction equipment, overhead and profit and all costs and expenses which May be required in and for the completion of the work described together with all costs and expenses in complying with all general risks, liabilities and obligations set forth or implied in the Drawings, Specifications and Conditions of Contract.

5. Drawings, Specifications and Bills of Quantities and all other Contract Documents are complementary and if any item is included in any of them, it shall be deemed included in all.

6. Should an item be included or implied in any of the Contract Documents, then it shall be considered as necessary for the proper execution of the Works and deemed to be included in the Contract Sum. Should an item required for the proper execution of the Works not be included or implied in any of the Contract Documents, then the items shall be considered as variations to the Contract requiring approval of the Employer.

7. The Contractor's bid for the entire work shall provide for supervision of any or all trades that is not intended to be performed with his own forces. No extra compensation for services as a General Contractor will be paid.

8. Some general items, provisional sums and allowances are to be tendered on a lump sum basis. For other work, the quantities shown in the Bills of Quantities are measured in accordance with the Specification.

9. The Works shall be measured for payment and will also be subject to adjustments as a result of changes in the scope of work through changes in Drawings and / or Specification in accordance with the Contract Documents as well as changes made in the field by the Engineer.

10. The Contractor shall verify quantities set out in the Bills of Quantities as being the quantities of the Works required to be executed by him in accordance with the Drawings and Specification. All unit rate items will be subject to re-measurement on completion.

11. In the event of there being any discrepancies between details on the Drawings, descriptions in Specifications and descriptions in the Bills of Quantities then the item shall be deemed to have been priced in accordance with the descriptions in the Bill of Quantities.

12. Any error in description or in quantity or in omission of items from the Bills of Quantities shall not vitiate this Contract nor release the Contractor from the execution of the whole or any part of the Works comprised therein according to the Drawings and Specifications or from any of his obligations or liabilities under the Contract.

13. The Bills of Quantities shall be used for evaluating variations and progress payments due to the Contractor.

14. The Contractor shall request written clarification from the Engineer of any point he considers to be a discrepancy or ambiguity. The Contractor is required to check the numbers of the pages of the Bills of Quantities and should any be found missing or in duplicate or the figures or writing indistinct, the Contractor must notify the Engineer at once and have the matter rectified before the Tender is submitted. No liability whatsoever will be entertained in respect of any claim for error in the Contractor's Tender resulting from failure to comply with the foregoing.

15. The Contractor should allow against the items or in the prices for everything contained in these Bills of Quantities, which has a monetary value.

16. A price or rate shall be entered by the Contractor against each item in these Bills of Quantities whether quantities are stated or not. Where the unit rate against any item is not identified in the Bill of Quantity, the tender shall be rejected.

17. Unit rates May be used reciprocally in the settlement of accounts. The Contractor is, therefore, to ensure that identical items occurring in separate bills are not priced at different rates unless this is his deliberate intention.

18. Amendment shall not be made to these Bills of Quantities without the authority, in writing, of the Engineer.

19. The Contractor shall not use these Bills of Quantities as a construction programme or for the purposes of ordering materials or arranging subcontracts.

    The references for these activities shall be the Drawings, Specification and instructions issued by the Engineer.

20. All costs associated with carrying out designs, preparing drawings, schedules and manuals, and submissions for the Engineer's approval where these are specified to be done by the Contractor, shall be deemed to be included in the rates and prices. Items for equipment and systems specified to be designed by the Contractor shall be deemed to include for all work necessary to ensure compliance with the performance requirements of the Specification.

21. Unless otherwise described or unless separate items have been measured, all prices for permanent works are to include for all the Contractor's facilities and services, materials, labour, Contractor's Equipment, transportation, all insurances, all taxation and duties, mobilisation and demobilisation, profit and overheads, etc. any temporary works and all else necessary to complete the activity.

22. Rates and prices are to include for all insurance and freight, customs duty, port dues and handling charges, the cost of transport from the port to site and all craneage, handling, storing and storage facilities. Where separate items have been measured for supply and for fixing or installation, the cost of the above shall be included in the prices for supply.

BILL OF QUANTITIES

CENTRAL ADMINISTRATION UNIT						
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD FACILITY						
EL REPOSO DEMONSTRATION STATION						
CAU22/23-PLER01						
BILL OF QUANTITIES						
	ITEM	SPEC. NO.	UNIT	QTY.	RATE	AMOUNT
A	**PRELIMINARY WORKS**					
1	Demolition and removal of Roof and ceiling. Sorting and piling of removed material. Offsite removal of all material as approved by the Engineer.	1			Lump Sum	
2	Demolition of block walls and floor. Cutting of block walls with masonry disc cutter for provision of doorways, installation of pipes etc. Cutting into concrete floor for ground beams. Include for offsite removal of material.	1	Square Metre	6		
3	Removal of windows and burglar proofing. Include for minor demolition of concrete. Burglar proofing to be kept for client.	1		9		
					SUBTOTAL A	
B	**ROOF AND CEILING**					
	All welded, fabricated and bolted site connections to the main structure shall be inspected by the Engineer these are to include steel wall plates 100mm x 100mm x 12mm thick fixed to ring beam and including placement of all J-bolts. Note labour items in this section shall be deemed included in the items.					
1	Supply and installation of rafters (UB 127mm x 76mm x 13kg/meter run) as per design drawings. Include for cleats, gussets, connections plates and all else as shown on drawing.	7	Linear Meters	96		
2	Supply and Installation of Zed purlins 150mm x 50mm x 1.5mm fixed to cleat (by bolting) as shown on drawings.	7	Linear Meters	280		

3	Supply and installation of Pre-painted,26 gauge Aluzinc roof sheeting (Nu wave profile), fixed to steel purlins as specified include for 50mm x 6mm diameter zinc coated steel self-threaded screws with neoprene washers on every rib and Z-purlin intersection.	7	Square Metres	238		
4	Supply and installation of Radiant Barrier - AstroECO with R + Heat shield Protection.	7	Square Meters	238		
5	Supply and installation of 16mm diameter H.T sag rods as shown on drawing. Include for bolts, washers and all else.	7	Number	72		
6	Supply and installation of pre-painted 26 gauge fascia flashing, sized 250mm width as specified.	15	Square Meters	64		
7	Supply and installation of pre-painted, 26 gauge drip edge and all else as specified.	15	Linear Meters	42		
8	Supply and installation of white pre-painted 26 gauge soffit panels and all else as specified.	15	Square Meters	60		
9	Supply and installation of rainwater guttering 150mm wide PVC guttering fixed to PVC brackets by screwing. Include for downpipes and all else.	7	Linear Meters	54		
10	Supply and installation of Gypsum ceiling as specified.18.4M x 9.24M. Include for reinforced support for recessed light fittings as specified.	14	Square Meters	170		
					SUBTOTAL B	
C	**TILING AND MASONRY**					
1	Surface preparation for tiling works. Include for scabbling floor, use of approved masonry fillers for minor cracks and all else. (Not to include for removal of old tiles). All masonry filler shall meet approval of the Engineer.	9	Square Metre	170		
2	Supply and installation of ceramic glazed tiles to floor as specified. Minimum price$60. ex supplier , Engineers choice (600mm x 600mm) conforming to IS : 15622	9	Square Metre	170		

3	Supply and installation of first grade quality ceramic glazed tiles to walls as specified. (300mm x 558mm or other sizes as approved by the Engineer) conforming to IS: 15622. Minimum price $45. Ex supplier Engineers choice. Include for transition strip to top row of all wall tiles as specified.	9	Square Metre	55		
4	Construction of reinforced concrete lintel for new doorways using 3-10mm HT steel reinforcement bars with 8mm stirrups @150mm c/c. Include for dowelling steel reinforcements into existing floor 200mm and setting with epoxy binder as per small building codes.	3	Linear Metre	6		
5	General masonry works. Hollow clay block work and mortar works / rendering with 3:1 mortar mix. Include for use of approved binding agents.		Square Metre	10		
					SUBTOTAL C	
D	**PLUMBING**					
	General plumbing works					
1	Supply and installation of water service pipe. CPVC pipes for hot water lines from water heater to shower stalls.	12	Metres	30		
2	Supply and installation of Stainless steel goose neck kitchen faucet. Include for all fittings and pipe work. Delta brand or equivalent as approved by the Engineer.	12	Number	1		
3	Supply and installation of drop-in face sink (white), American Standard or equivalent brand as approved by the Engineer. Complete with stainless steel faucet, angle valve, all fittings and pipe work.	12	Number	2		
4	Supply and installation of American Standard or equivalent close couple toilet set complete with tank, angle valve, seat cover, fixtures and pipe work and all else.	12	Number	4		
5	Supply and installation of shower head and mixer control in Brushed Nickel. Delta brand or equivalent as approved by the Engineer.		Number	2		
6	Supply and installation of a 3/4 HP Centrifugal Smart Head Water pump. Gould brand or equivalent as approved by the Engineer.		Number	1		
7	Supply and installation of a 30 gallon electric water heater. Bradford White brand or equivalent as approved by the Engineer. Include for mounting, electrical works and all else. Service for two showers. Minimum 2 year warranty included.		Number	1		
					SUBTOTAL D	

E	**ELECTRICAL**					
	Supply and installation of **ALL** electrical works necessary as outlined. **CONTRACTOR** is required for any additional breakers, wires and all else.					
1	Supply and install 120V 2x4 ft. recessed lay in LED light fittings to fit standard grid ceiling. 60 W, 5400 Lumens. White finish powder coated sheet steel housing. Complete with diffusers and all else.	11	Number	25		
2	Supply and installation of one way and two way light and power switches.	11	Number	2		
3	Supply and installation of AC units 12,000 BTU, wall mounted split unit (Minimum 5-Star rating inverter type) including all necessary fittings and mountings as specified by the manufacturer. Include for minimum 1 year warranty inclusive of quarterly servicing. Warranties shall be given in writing.		Number	3		
4	Supply and installation of AC units 18,000 BTU, wall mounted split unit (Minimum 5-Star rating inverter type) including all necessary fittings and mountings as specified by the manufacturer. Include for AC isolators and all else. A minimum of two years warranty shall be given in writing.		Number	3		
5	Supply and installation of AC units 36,000 BTU, wall mounted split unit (Minimum 5-Star rating inverter type) including all necessary fittings and mountings as specified by the manufacturer. Include for AC isolators and all else. A minimum of two years warranty shall be given in writing.		Number	1		
6	Supply and installation of Emergency exit Commercial Electric Combo. 14-Watt Integrated LED Exit Sign (White) with two Emergency Lights. Ni-Cad 9.6-Volt Battery included.	11	Number	2		
7	Supply and installation battery operated smoke/ heat detectors with test button and warning light.		Number	3		
					SUBTOTAL E	
F	**STRONG ROOM AND WEAPONS STORAGE**					
1	Supply and installation of deck pan for strong room ceiling. 0.6858 mm wide decking pan anchored to walls as shown on drawing.	3	Metre	16		

2	Concrete ceiling over Strong room. Concrete 25N/mm in 28 days; reinforced with 1 y12 bar in each trough and 1 layer of #65 BRC throughout and all else as specified on drawings.	3	Square Metre	8		
3	Supply and installation of reinforced concrete block work. 150mm x 200mm x 400mm loaded and reinforced as per design drawings. Include for tying reinforcing steel into ground beams.	4	Square Metre	24		
4	Construction of reinforced concrete ground beams 300mm x 300mm with 4 pcs 12mm H,T steel and 10mm stirrups @ 200mm. Concrete 25N/mm in 28 days	3	Metre	10		
5	Supply and installation of electronic dead bolt lock. Key pad and keyed entry. Include for all concealed wiring and all else to make lock operational. Kwikset brand or equivalent as approved by the Engineer.		Number	1		
6	Supply and installation of Steel security/fire exit doors. 18 gauge sheet metal construction door panels with max. Width 914mm and max. Height 2030mm as specified. Include for Fire resistant door threshold and 3 dowel stud steel hinges .Include for door stays, and additional internal reinforcements. Primed and spray painted with marine grade paint as specified. CASFAB LIMITED brand or equivalent as approved by the Engineer.	10	Number	1		
7	Supply and installation of 14-gauge steel (through-out the entire cabinet) gun safety cabinet. Coated with a heavy-duty powdered coat finish (black). 1.83Metre high x 1.83 Metre wide x 0.38 Metre Deep. Complete welded construction, containing Heavy-duty continuous hinges and a removable base for easy floor mounting. The cabinet shall include reinforced mounting holes on back and bottom of cabinet. Include for key locking handle with a 3-point locking system with additional steel plate to protect locking system and all else.	10	Number	1		
					SUBTOTAL F	
G	**WINDOWS, DOORS , BURGULAR PROOF**					

	Standard UPVC frames Windows: Glass: Bronze, grey or clear glass. The UPVC windows are to be attached on to the wall voids using 38mm stainless steel self-tapping Phillip head screws countersunk head adhering to code (TA282) and crabs mortared into the walls. The windows shall have ALL hardware defined as handles, hinges, locks and operators.					
1	Supply and installation of 914mm x 1829 mm UPVC slider window with insect screen as shown on drawings.			1		
2	Supply and installation of 1220mm x 1829 mm UPVC slider window with insect screen as shown on drawings.	10	Number	7		
3	Supply and installation of steel burglar proof gate for windows 1220 mm x 1829mm, with 32mm thick framing and 12mm x 12mm solid square intermediate bars, with relevant latch/assembly for the use of a padlock and lock box (3mm thick). Include for three (3) heavy duty butt hinges, three (3) flat steel plates cut and drilled to hold two (2) bolts each using 12mm Rawl or Hit-It expansion bolts. As per design drawings.	6	Number	2		
4	Repairs to steel burglar proofing. Cleaning, wire brushing, removal of old paint. Replacement of rotted sections by arc welding, ground to smooth finish and painted as specified.		Number	6		
5	Supply and installation of Glazing for interview room. 1200mm x 1200mm x 6mm laminated glass in 38mm Aluminium frame. Include for one way tint material applied to glass and all else.				Lump Sum	
	Doors					

6	Supply and installation of Steel security/fire exit doors. 18 gauge sheet metal construction door panels with max. Width 914mm and max. Height 2030mm as specified. Include for Fire resistant door threshold with a single fire exit (push bar lock) bar, up/down shoot bolts and 3 stainless steel hinges .Include for door stays, kick plates and reinforcements for push bar installation. Include for priming and spray painting with marine grade paint as specified.CASFAB LIMITED brand or equivalent as approved by the Engineer.	10	Number	2		
7	Supply and installation of Steel Half French security doors with glazing. Double doors with18 gauge sheet metal construction, 45 mm thick door panels with max. Width 1828mm and max. Height 2030mm as specified. Include for Fire resistant door threshold and 3 stainless steel hinges .Include for door stays, kick plates ,degreasing , priming and spray painting with marine grade paint as specified.CASFAB LIMITED brand or equivalent as approved by the Engineer.		Number	1		
8	Supply and installation of first Grade, 6 panel pitch pine doors, Sanded, sealed and sprayed with two coats of varnish.	10	Number	4		
9	Supply and installation of first grade 6 panel Cedar doors, Sanded, sealed and sprayed with two coats of varnish.	10	Number	5		
10	Supply and installation of Heavy duty Aluminium door frames for new doorways as shown on drawing, level and plumb. Include for necessary mortar works and all else.	10	Number	5		
11	Supply and installation of keyed entry door knob with adjustable backset. Kwikset brand or equivalent as approved by the Engineer.		Number	11		
12	Supply and installation of steel sliding door track mechanism. Top mounted door slide system complete.		Number	1		
					SUBTOTAL G	
H	**CABINETS AND COUNTERS**					

1	Supply and installation of base cabinets 812mm H x 901mm W x 609 mm D, fully waterproof and termite proof. Single drawer and double doors with single shelf. Solid Cedar wood frame and doors with soft close fully concealed hinges. Include for draw and door pulls and handles and all else as specified.	10	Number	2		
2	Supply and installation of base cabinets 812mm H x 901mm W x 609mmD, fully waterproof and termite proof carcass. Double doors no shelf. Solid Cedar wood frame and doors with soft close fully concealed hinges. Include for handles, filler panels and all else as specified.	10	Number	1		
3	Supply and installation of wall cabinets 810mm H x 470mm W x 308mmD, fully waterproof and termite proof carcass. Solid Cedar wood frame and doors with soft close fully concealed hinges. Include for door pulls and all else as specified.	10	Number	1		
4	Supply and installation of microwave cabinets 810mm H x 610mm W x 460mmD, fully waterproof and termite proof carcass. Solid Cedar wood framing.	10	Number	1		
5	Supply and installation of base vanity cabinets, fully waterproof and termite proof carcass. Solid Cedar wood frame and doors with soft close fully concealed hinges. Draw and door pulls and handles and all else as specified.	10	Number	2		
	CHARGEROOM COUNTER					
6	Supply and installation of solid surface countertops. 12mm thick 711 mm wide for charge room counter. Include for bull nosing on exposed edges and all else. Neutral colour and pattern to be chosen by the Engineer.		Square Metre	4		
7	Supply and installation of charge room counter base 4159mm long x 660mm Wide with drop top. Pressure treated lumber for <u>all</u> components built as shown on drawing.				Lump sum	
8	Construction of 1828mm high x 100 mm thick, drywall partitions complete with steel framing and anchored to concrete floor using12 mm stainless steel expansion (hit it) bolts. Waterproof gypsum sheets both sides, secured to steel framing as specified. Include for taping ,mudding, sanding , gypsum primer and paint , 75mm vinyl strip to base on both sides and all else as specified.	28	Square Metre	40		
					SUBTOTAL G	

I	**PAINTING**					
1	Preparation of masonry surfaces for painting. Use commercial cleaning solution, where necessary use scrapers and grinding tools to remove all surface contaminants in preparation for painting.				Lump Sum	
2	Priming of masonry walls with two coats of concrete primer. (Berger brand or equivalent as approved by the Engineer)		Square Metre	100		
3	Painting of masonry surfaces with two coats emulsion. (Berger brand or equivalent as approved by the Engineer).Colour to be chosen by the Engineer.		Square Metre	1000		
					SUBTOTAL H	
J	**CONSTRUCTION OF TANK PLINTH 2273mm x 12000mm AND PUMP ENCLOSURE 2273mm x 1067mm**					
1	Excavation for Plinth foundation as per design drawings.	2	Cubic Metre	7		
2	Supply, place and compact select hardcore material for Pad foundation (150mm thick) as per design drawings.	5	Cubic Metre	4		
3	Supply and place 10mm dia. H.T. Steel bars as per design drawings. Include for hooks, bending, tying of steel and all else.	3	Kilogram	72		
4	Supply and place 12mm dia. H.T. Steel bars every core as per design drawings. Include for hooks, bending, tying of steel and all else.	3	Kilogram	224		
5	Backfilling and compaction to 95% proctor clean fill sand 50 mm thick as per design drawings.	5	Cubic Metre	2		
6	Supply and place damp proof course (500 gauge, 127mu polythene) with 300mm side and end laps as required.		Square Metre	24		
7	Supply and place steel reinforcing fabric (BRC), 150mm x 150mm x 65g with 300mm side and end laps as required.	3	Square Metre	24		
8	Supply, place and compact grade 25 concrete as per design drawings. Include for erection and striking of all formwork and all else. Finished sides and surface to be made smooth.	3	Cubic Metre	5		

9	Reinforced concrete block work. Builder blocks 150mm x 200mm x 400mm loaded and reinforced as per design drawings. Include for plastering.	4	Square Metre	8		
10	Supply and installation of 75mm deep x 6858mm wide decking pan as shown on design drawings.	3	Metre	5		
					SUBTOTAL J	
K	**CARPARK**					
	CONSTRUCTION OF CONCRETE PAVED SURFACE.13m X 16.3m					
1	Excavations for driveway, foundation etc. as per design drawings.	2	Cubic Metre	44		
2	Supply, place and compact select hardcore material for foundation (150mm thick) as per design drawings.	5	Cubic Metre	32		
3	Supply and place 12mm dia. H.T. Steel bars as per design drawings. Include for hooks, bending, tying of steel and all else.	3	Kilogram	1000		
4	Backfilling and compaction of foundation with clean fill sand 50 mm thick as per design drawings.	5	Cubic Metre	12		
5	Supply and place damp proof course (500 gauge, 127mu polythene) with 300mm side and end laps as required.		Square Metre	214		
6	Supply and place steel reinforcing fabric (BRC), # 65 with 300mm side and end laps as required.	3	Square Metre	214		
7	Supply, place and compact grade 25 concrete 125mm as per design drawings. Include for erection and striking of all formwork and all else.	3	Cubic Metre	26		
8	Reinforced concrete block work for box drain(24M long x 0.4M High). 150mm concrete block reinforced with 12mm HT steel, loaded with concrete and plastered to smooth finish both sides as shown on drawing.	4	Square Metre	10		
					SUBTOTAL K	

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD FACILITY
EL REPOSO DEMONSTRATION STATION

CAU22/23-PLER01

SUMMARY

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B	**ROOF AND CEILING**	
C	**TILING AND MASONRY**	
D	**PLUMBING**	
E	**ELECTRICAL**	
F	**STRONG ROOM AND WEAPONS STORAGE**	
G	**WINDOWS ,DOORS , BURGLAR PROOF**	
H	**CABINETS AND COUNTERS**	
I	**PAINTING**	
J	**CONSTRUCTION OF TANK PLINTH 2273mm x 12000mm AND PUMP ENCLOSURE 2273mm x 1067mm**	
K	**CARPARK**	
	Subtotal A-K	
	10% Contingency	
	Subtotal	
	12.5% Value Added Tax	
	Grand Total	

……..
Contractor's Name (BLOCK LETTERS)

……..
Contractor’s Signature

……..
Date

Contractor’s Stamp

SPECIFICATIONS

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1.0 DEMOLITION OF EXISTING STRUCTURES

1.1 Description

a) The work to be done in this section includes the careful dismantling of the existing building structures as specified inclusive of concrete walls and counters, metal windows, plumbing fixtures, cabinets, tiles and all else as described in the bills of quantities. Sorting and transport of the removed materials as instructed by the Engineer. The contractor is required to dispose of any materials deemed unusable by the Engineer.

1.2 Workmanship

a) All excavation, cutting, loading and pulling down shall be done in such a manner as to cause as little inconvenience as possible to existing occupiers of the premises or the public and the contractor must accept responsibility for any claims which may arise. All debris must be kept well-watered during work to prevent dust arising.

b) All requisite temporary shoring, strutting or other supports to walls, floors, roofs, etc. necessary for the protection and safety of existing structures and their contents shall be provided by the Contractor.

c) Reusable materials shall be sorted and stacked in accordance with the Engineer's instructions.

d) All resultant holes and trenches formed by the preceding activities shall be backfilled and compacted using selected earthfill sourced from the site and approved by the engineer. On masonry surfaces, holes and openings shall be repaired using mortar screeds and fillers as approved by the Engineer.

e) Level and compact the area identified by the engineer for the new building works.

1.3 Measurement and payment

The rates for this section shall include all the activities required to demolish the entire existing structure as outlined at section 1.1 of these specifications and

dispose of all material deemed unusable by the engineer**.** Materials considered reusable by the engineer shall be neatly sorted and stacked as instructed by the engineer at the contractor's expense. The unit of payment shall be a lump sum payment.

2.0 EXCAVATION AND EARTHWORKS

2.1 Description

The work to be performed under excavation and earthworks shall include:

1) Clearing and grubbing of work site in preparation.

2) All the necessary excavation for the building foundation, drains etc. This work shall include all the necessary bailing, pumping, draining, sheeting, shoring and bracing required. Including where applicable the grading and levelling of the site after the clearing and grubbing or demolition works outlined earlier in the applicable specifications.

3) The furnishing, placement, levelling and compaction of selected excavated material, hard-core and blinding in the areas indicated in the drawings or as indicated by the engineer in preparation for reinforced concrete construction

2.2 Clearing and grubbing

This activity consists of clearing and grubbing the building area plus an additional area of up to maximum of (5) metres on all sides of the building. The work to be performed under this Activity consists of the removal and satisfactory disposal from the site, of remnants of existing surfaces, landslides, grass, trees and other vegetation including grubbing up of roots from the entire grubbed area. It also includes the backfilling of resultant trenches, holes and pits as approved by the engineer. The resultant surface after clearing and grubbing should be to the grades and levels outlined by the engineer

2.3 Excavation

The trenches or foundation pits for footings and septic systems shall be excavated to the lines, grades and elevation shown on the drawings. They shall be of sufficient size to permit the placing of structures of the full dimensions shown in

the drawing. The elevation of the bottom of the footing or pit walls as shown in the drawings shall be considered as approximate only and the Engineer may order, in writing, such changes in dimensions or elevations of footings as may be deemed necessary for a satisfactory foundation.

Boulders, logs or other objectionable materials encountered in the excavation shall be removed. The sides of pits, trenches and other excavations shall, where necessary, be adequately supported by timber or other means, and all such excavation shall be to sizes sufficient to enable the concrete structures to be laid accurately and proper refilling and compaction to be carried out.

All excavation works for structures shall be carried out at the contractor's expense including excavation in rock, peat, muck etc.

2.4 Hardcore and blinding

2.4.1 Materials

Material for hardcore shall be selected granular material consisting primarily of stone, sand, gravel or other acceptable material. All of the material shall pass the 50mm square sieve, not more than 40% shall pass the no.40 mesh sieve and not more 10% by a weight shall pass the no. n.200 mesh sieve. The soaked C.B.R. shall not be less than 50. Road base quality pitrun gravel may be suitable for this purpose.

Material for blinding shall be sourced from an approved sand quarry. It shall be clean sand free from clay, silt and other deleterious material. All materials shall be approved by the engineer prior to use.

2.4.2 Workmanship

Compaction of all materials shall be carried out in layers not exceeding 100mm. The material shall be brought to the optimum moisture content so as to attain a dry density of at least 95% of the maximum density on compaction.

Compaction plant shall meet the approval of the engineer. Appropriately sized plate compactors or hand held rammers may be used.

The surface of the filled area shall be to the line and grades shown in the drawings and established by the engineer.

2.5 Measurement and payment

The rates in this section shall include for all the necessary labour, materials, tools and equipment required for excavating, loading, transporting, bailing, compacting, wetting, pumping, draining, sheeting, shoring and bracing and all else required for the is activity. The rates for hard-core and blinding to foundation and concrete areas shall include for the furnishing, placing, levelling and compacting the required materials to the lines levels and grades shown in the drawings. The unit of payment for each activity shall be as indicated in the bills of quantities.

3.0 CONCRETE AND REINFORCING STEEL

3.1 Description

This work shall consist of preparing, mixing and placing concrete structures, constructed in conformity with the lines, grades and dimensions shown on the drawing or ordered in writing by the Engineer and in accordance with this and other specification sections involved.

3.2. Materials

Concrete Aggregate

Material used as aggregate for plain or reinforced concrete shall, wherever possible, be derived from a source that normally produces aggregate satisfactory for concrete and if requested by the Engineer, the Contractor shall supply evidence to this effect.

Aggregate shall be chemically inert, strong, hard durable, of limited porosity, free from adherent coatings and shall contain no organic or other admixtures that may, in the opinion of the Engineer, cause corrosion of the reinforcement or impair the strength or durability of the concrete. The use of limestone for concrete aggregate shall not be permitted.

a. Coarse Aggregate

Coarse aggregate shall be clean hard natural gravel or crushed stone and its grading shall comply with B.S. 882:1983. Stone of a flaky or scalped nature shall not be used as coarse aggregate. All coarse aggregate shall be washed clean and shall be free from dust, loam, silt, clay or any other material. Coarse aggregate, should have normal grading 5 mm – 20 mm

B.S. 140 test sieve and containing no finer material than is permitted for the various sizes in this specification.

Each grading shall be stored on site in separate areas, in such a way as to avoid contamination or the risk of picking up dirt, earth, clay etc. Any coarse aggregate that does not comply shall be removed from the site.

b. Fine Aggregate

Fine aggregate shall be clean sharp natural sand or crushed stone or gravel sand and its grading shall comply with B.S. 882:1983. If necessary, the sand is to be washed after delivery without extra charge.

Fine aggregate shall be stored on the site in such a way as to avoid contamination or the risk of picking up dirt, earth, clay etc. Generally the fine aggregate is to be well graded coarse sharp sand and mainly passing B.S. 410 test sieve. Any fine aggregate which does not comply shall be removed from the site.

c. Cement

The cement is to be best quality normal setting Portland cement of local manufacture conforming to B.S. 12:1978.The cement shall be stored in sheds or under suitable covers which are water tight and damp-proof, and on wooden floor not less than 30 cm (1ft) above the ground. Bags of cement which for any reason have become partially set, or which contain lumps of caked cement, shall be rejected. The use of cement reclaimed from discarded or used bags will not be permitted.

Each grading shall be stored on site in separate areas, in such a way as to avoid contamination or the risk of picking up dirt, earth, clay etc. Generally the fine aggregate is to be well graded coarse sharp sand and mainly passing B.S, 410 test sieve. Any fine aggregate which does not comply shall be removed from the site.

b. Admixtures

Admixtures for accelerating initial setting of the cement or for increasing the permeability or workability of the concrete or for any other purpose shall be used only if approved by the Engineer. Admixtures or other materials that retard the setting of the cement shall not be used.

c. Water

All water used in concrete shall be subject to the Engineer’s approval, shall be reasonably clear and free from oil, acid, alkali, sugar, and vegetable substances and, if required by the Engineer, shall be tested by comparison with distilled water.

Water shall be obtained from public supply and no water taken from a spring, well, river or similar source or from the excavations, unless approved in writing by the Engineer. If instructed, samples of water collected in an approved manner shall be submitted for the purpose of analysis and for making concrete tests.

3.3 Composition

The Contractor shall state the mix proportions and water content of his trial mixes. After approval by the Engineer these mix proportions and the water content shall not be changed. Table 7.1 provides the recommended mix proportions and water cement ratios required for various grades of concrete.

The Contractor shall take six concrete cubes from concrete poured on the site at regular intervals, from all major concrete works, and when required by the Engineer. The cubes shall be numbered and the date, particulars of mix, and position of the batch shall be recorded.

Concrete, the strength of which falls below the minimum working strengths required, shall be cut out and made good entirely at the Contractor's expense.

The Contractor shall by previous experiment and investigation determine the correct proportions necessary to produce a minimum concrete crushing strength required.

The minimum strengths required of these trial concrete cubes shall be the specified minimum strength times a factor representing the quality control on the site. In the first instance this factor shall be taken as 1.5. If the site control proves poor, the Contractor shall provide new trial mixes to strengths, determined by the Engineer.

The Contractor shall supply the Engineer with mix concrete cubes of each Concrete Quality for testing in accordance with the ASTM G172 requirements before the commencement of concrete work in order that the seven (7) days strengths may be ascertained before the pouring of concrete on the site.

Table 7.1

Nominal Proportion	Grade	Max. Aggregate Size (mm)	Min. Ultimate Compressive Strength at 28 days	Min. Cement Kg/m3	Max. W/C ratio	Workability (mm)
1:1:2	30	20	30 N/mm2	360	0.45	75
1:1.5:3	25	20	25 N/mm2	360	0.45	75
1:2:4	20	20	21 N/mm2	360	0.5	75
1:3:6	10	37.5	10 N/mm2	240	0.5	100

3.4 Mixing and Transporting of Concrete

3.4.1 Site Mixing

The mixing of concrete on site shall be allowed only with the written permission of the engineer. All the material specifications for cement aggregate and water outlined in section 7.2 of these specifications shall apply.

Mixing of concrete shall be carried out in an approved mechanical batch mixer. The water shall not be admitted to the drum of the mixer until all the cement and aggregate forming the batch are in the drum. Mixing shall continue until there is a uniform distribution of the materials and the mass is uniform in colour and consistency.

Concrete should be handled from the place of mixing to the place of final deposit as rapidly as practicable by methods which will prevent the segregation or loss of the ingredients. It should be deposited as nearly as practicable in its final position to avoid re-handling and flowing.

Where hand mixing is authorized it shall be carried out on a water tight platform and in such a manner as to ensure a uniform distribution of the materials throughout the mass. Mixing shall be continued until a homogeneous mixture of the required uniform colour and consistency is obtained.

3.5 Pre mixed Concrete

Permission must be obtained and the name of the supplier submitted before the use of ready mixed concrete. Permission from the Engineer must also be obtained to change the supplier of ready mixed concrete.

The concrete must be discharged into the formwork within 45 minutes of mixing. Any ready mix concrete that has not been deposited within 45 minutes of mixing shall not be used and shall be removed from the site.

3.6 Testing

1. Slump Test

Concrete shall have a slump such that it will be workable in the required position. It shall be of such a consistency that it will flow around reinforcing steel, but individual particles of coarse aggregate when isolated shall show a coating of mortar containing its proportionate amount of sand.

During concreting, slump tests should be taken periodically to check for consistency, and should be in accordance with B.S. 1881: Part 2: 1970. The contractor should keep a standard slump cone on site.

The slump of concrete shall not exceed the following:

a. For mass and lightly reinforced concrete sections easily accessible for spading and working such as deck and invert slabs, base for drains, etc. – 75 mm.

b. For heavily reinforced sections not easily accessible for spading and working 100 mm. The water cement ratio of all concrete shall be as low as practical to place the concrete, and all batches of the same section shall be of uniform consistency.

2. Cube Test

During concreting 150 mm x 150 mm x 150 mm (6" x 6" x 6") concrete cubes shall be taken from any respective mix, 3 cubes to be crushed at 7 days and 3 at 28 days. One set of cubes to be taken every main concrete pour. The cube samples are to be taken by placing the concrete in the mould in 5 cm layers, each layer being thoroughly compacted with a steel rod 37.5 mm square and weighing 1.8 kg (4 lbs.). The concrete should be subjected to at least 35 strokes per layer. All cubes must be left in the mould for 24 hours and then in damp sand until tested. The result of the tests must comply with specified strengths.

3.7 Placing Concrete

All concrete shall be placed before it has taken its initial set and, in any case within 45 minutes of mixing. Concrete shall be placed in such a manner so as to avoid segregation of coarse or fine portions of the mixture, and shall be placed in horizontal layers when practicable. The concreting shall be so arranged that complete sections of the work are carried out at one operation. Concrete is not to be used after it has developed initial set and all concrete that has commenced to set before use shall be rejected

The concrete shall be deposited in layers not exceeding 20 cm (8") thick and efficiently rammed and packed between and around the reinforcement with rammers and spatulas as well as using a heavy duty high frequency vibrator, so as to thoroughly fill the formwork and to form a dense homogenous mass with a smooth compact face and to ensure that no voids or cavities are left. The ramming is not to be confined to the upper surfaces of the layer deposited but the whole must be well rammed and consolidated until the mass assumes a jelly-like appearance and consistency, with water just appearing on the surface.

Vibrators shall be of sturdy construction and adequately powered. The vibrator shall be sufficiently intense to cause the concrete to flow or settle readily into place and visibly affect the concrete over a radius of at least 46 cm. There shall be at least 20 seconds of vibration of all concrete where the vibrator is inserted but care must be taken to avoid over vibration.

No water shall be added to the concrete once it has been discharged from the mixer although the concrete may be mixed or agitated to help maintain workability.

3.8 Curing Concrete

The concrete should be protected from damage and contamination during the process of setting. All concrete shall be kept moist on all exposed surfaces for 7 days after depositing by means of a layer of sand or other suitable material kept wet by watering at frequent intervals.

3.9 Faulty Construction

The Contractor shall cut out and reconstruct any portion of the work which give evidence before or after the concrete was of faulty quality at the time of depositing or was not properly deposited and sufficiently rammed and vibrated or that any reinforcing bars have been omitted, incorrectly placed or displaced, or of any fault, defect of injury, from all cases whatsoever, which may prejudicially affect the durability and strength of the construction.

3.10 Placing Formwork

All formwork must be approved by the Engineer prior to placement of concrete.

3.11 Placing Reinforcement

Reinforcing bars should be bent cold and bent and placed strictly in accordance with the drawings. Reinforcing bars must be installed free of dirt, oil or other chemicals or chemical residues. The stirrups connecting main bars should be tight around the main bars so that they are securely held and braced. All bars should be bound together at intersections with each other with 16 gauge soft iron wire, doubled and twisted tightly together with pliers. Mesh reinforcement is to be bent, placed and tied together in a similar manner.

Reinforcement in position, irrespective of whether or not it is partly embedded in hardened concrete should not be bent without permission. Bars left exposed are to be protected against exposure and corrosion.

3.12 Forming Construction Joints

Construction Joints shall be located where shown on the Drawings or permitted by the Engineer. Construction joints shall be perpendicular to the principal lines of stress and in general shall be located at points of minimum shear.

At horizontal construction joints, gauge strips 38 mm thick shall be placed inside the forms along all exposed faces to give the joints straight lines. Before placing fresh concrete, the surfaces of construction joints shall be washed and scrubbed with a wire broom, drenched with water until saturated until the new

concrete is placed. Immediately prior to placing new concrete, the forms shall be drawn tight against the concrete already in place and the old surface shall be coated thoroughly with a very thin coating of neat cement mortar. Concrete in substructures shall be placed in such manner that horizontal construction joints will not be exposed to view in the finished structure. Where vertical construction joints are necessary, reinforcing bars shall extend across the joints in such a manner as to make the structure monolithic.
Necessary dowels, load-transfer devices, and bonding devices shall be placed as shown on the Drawings or directed by the Engineer.

3.13 Bonding to New Concrete

Before depositing new concrete on or against concrete which has hardened the forms shall be retightened. The surface of the hardened concrete shall be roughened by green cutting, chipping or sand blasting, as required by the Engineer so that sound concrete is exposed. It shall be thoroughly cleaned of foreign matter and laitance and saturated with water. If oil has been spilled on the surface to be bonded, this oil must be removed by chipping out the oil saturated concrete. To ensure an excess of mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and saturated mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and saturated surfaces, including inclined surfaces, shall first be covered with a coating of mortar against which the new concrete shall be placed before the grout has attained its initial set. On horizontal construction joints, at least 50 mm of grout shall be provided. The proportions of sand and cement in the grout shall be the same as those for the sand and cement in the concrete mixture, and only sufficient water to provide a consistency similar to that of thick cream shall be used.

3.14 Measurement and payment

Separate payment for concrete shall be made only where it is specified in the Bills Quantities.

3.14 a Measurement

The quantities to be paid for under this Section will be the number of cubic metres (except where another basis of payment is indicated in other sections of these Specifications) of Cast-in-place Concrete, complete in place and accepted in accordance with these Specifications, within the lines, grades and dimensions shown on the Drawings or ordered by the Engineer. No deductions will be made for the volume occupied by bevels, bar reinforcing steel, weep holes, bolts, dowels, conduits or other openings less than 1000 square centimetres in area or pile heads embedded in the concrete. Reinforcing steel shall be measured and paid for as provided in Clause 504.

3.14 b Payment

Payment for items under this Section will be at the prices tendered in the bill of Quantities for the various types of concrete to be used in the structures and such prices and payments shall constitute full compensation for furnishing all labour, coarse aggregates, fine aggregates, Portland cement, water, form work, bracing, weep holes, joint filler, all other materials, tools, equipment, incidentals and all else involved in constructing the concrete work complete in place, all as shown on the Drawings, as specified in these Specifications and as directed by the Engineer. The prices and payments shall also include for furnishing and placing construction joints, abutment joint materials, Styrofoam, dowels, sleeves, adhesive, water for curing and including the cost of preparation of all concrete surfaces etc., all as shown on the Drawings, as specified in these Specifications and as directed by the Engineer. The prices and payments shall also include for furnishing and placing the following, when they are not included in other items: bearings, sealing materials, water stops and waterproofing membranes all as shown on the Drawings as specified in these Specifications and as directed by the Engineer.

3.15 Reinforcing Steel

Separate payment for reinforcing steel shall be made only where it is specified in the Bills Quantities.

a) Description

The work to be performed under this Section consists of furnishing and placing reinforcing bars of the grade, type and size designated, in accordance with these Specifications, and in conformity with the locations shown on the Drawings.

b) Materials

Bar reinforcement in sizes up to and including 32 mm. shall conform to the requirements of ASTM 615 Grade 60 from billet steel grades.

If purchased in small lots from a warehouse, reinforcement may be accepted at the discretion of the Engineer upon certification that it meets the requirements of the Specifications listed above and subject to the

applicable bending test.

Bar reinforcement for concrete structures, except that 6 mm which may be round, shall be deformed bars.

c) <u>Construction Requirements</u>

1. General

The Contractor shall prepare, thoroughly check, and submit to the Engineer for approval, working drawings, bar lists, and bar bending diagrams as may be required for the detailing and placement of reinforcing steel to all reinforced concrete structures. Weights of steel shall be shown for each structure.

Working drawings shall be 600 mm x 900 mm in size. Bar lists may be on smaller size sheets.

Four prints of each shall be submitted to the Engineer for his approval. Approval of these Drawings by the Engineer shall not relieve the Contractor of any of his responsibilities under the terms of the Contract.

2. Bending and Placing

Bars shall be cold bent to the shapes shown on the Drawings and all bends shall be made accurately around pins of the following sizes:

Bars 25 mm and under: minimum pin size of 6 times the bar diameter

Bars larger than 25 mm: minimum pin size of 8 times the bar diameter

Ties: pin size over 2 times, but not greater than 4 times the bar diameter.

The extension of free ends on hooks shall be 4 times the bar diameter, but not less than 60 mm. Bends for stirrups and ties shall have radii on the inside of the bar of not less than one bar diameter.

All reinforcement shall be free from dirt, oil, paint, grease, mill scale, and loose or thick rust when placed. Reinforcement shall be placed accurately in the positions shown on the Drawings and held securely during the placing and compacting of concrete.

Main reinforcing bars carrying determinate stresses shall be spliced only where shown on the Drawings unless approval is obtained from the Engineer in writing before the reinforcing steel is ordered. Other reinforcing bars shall have a minimum length of 6 metres unless otherwise specified in the Drawings or limited by the physical dimensions of the section being reinforced. Splices shall be staggered as far as possible. Unless otherwise called for on the Drawings, a minimum lap length of 40 times the diameter of the bars shall be maintained.

Bars shall be tied at all intersections except where spacing is less than 300 mm in each direction, when alternate intersections shall be tied. Distances from the forms shall be maintained by stays, precast mortar blocks, ties, hangers or other approved supports. Welding of reinforcing steel shall not be permitted.

The placing and fastening of reinforcement in each section of the work shall be approved by the Engineer before any concrete is deposited in the section.

Chairs for supporting deck reinforcement steel shall be either of galvanized steel, approved plastic material, or precast concrete blocks acceptable to the Engineer. The maximum spacing of the chairs shall be 1.20 metres. The location of the top reinforcement steel (with respect to deck surface) shall be checked by running a full deck width template along the longitudinal screeds.

No main steel shall touch the template nor be more than 6 mm distant from it.

d) ***<u>Measurement and Payment</u>***

Measurement

The quantities of Reinforcing Steel under this Section will be measured as the number of Kilograms (except where another basis of payment is indicated in other sections of these Specifications) complete in place and accepted as shown on the approved working Drawings and bar list and not covered by other Tender items.

The unit weights for deformed bars to be used in determining payment shall be as follows unless shown otherwise on the Drawings or directed by the

Engineer.

Size mm	Weight per metre (kg)
6	0.222
8	0.395
10	0.616
12	0.888
16	1.579
20	2.466
25	3.854
32	6.313
40	9.864

Clips, ties, separators, spacers or other materials used for positioning or fastening the reinforcement steel in place, shall not be included in the weights measured for payment under this item.

e) ***Payment***

Payment will be made at the prices tendered for the item under this Section as it appears in the Bill of Quantities. The prices and payment shall constitute full compensation for materials, labour, tools, equipment and all else necessary to complete the work described herein in strict conformance with these Specifications and as approved by the Engineer.

There will be no payment for additional steel incurred due to the Contractors splicing at locations other than those shown on the Drawings or as ordered by the Engineer.

Sealants

Acrylic-Based Floor Sealer

Description

The works shall consist of the application of a solvent based acrylic curing and sealing treatment to new or existing concrete in order to provide a dustproof finish; to be used on interior and exterior surfaces, allowing for an easy to clean area as well as promoting resistance to penetration of most oils and liquids.

Materials

For the purpose of sealants described in this section, Spec-Crete Superseal B66 (pigmented) shall be used.

The Contractor May propose alternative products he intends to use in the Works and shall submit to the Engineer for approval full information on these products. All products shall have no adverse effects on potable water. Products named in this section are an indication of the standard type and workmanship of goods which are satisfactory to the Engineer. The Contractor May use named products or equivalent other products after the approval of the Engineer in accordance with the Specifications, Conditions of Contract and with the manufacturers specifications.

Physical and Chemical Properties

Appearance:	Colourless to light yellow, clear liquid
Pigment:	Silver or grey
Specific Gravity:	0.85-0.87
% Solids:	25
Shelf life:	1 year (in original, unopened containers)

Execution

The sealant shall be applied in accordance with the Manufacturer's instructions where the application procedure differs from the guidelines outlined in this section.

New Floors

The sealant shall be spray applied to the concrete surface. Prior to the application of the sealant the surface of the concrete must be worked through power floating or brushing after the disappearance of bleed water to remove any laitance layer. The concrete shall be left for ten (10) minutes after working before application of the first coat.

When spraying the nozzle shall be held approximately 500mm from the surface and passed back and forth to ensure complete coverage. The pressure on the pump must be maintained at all times to produce a fine spray.

The second coat shall be applied when concrete surface has completely dried, after application of the first coat.

Existing Floors
Any laitance or existing coatings shall be removed.

All cracks or holes shall be repaired using a resin repair compound and any oil and grease contaminated surface treated with a suitable degreaser, washed with clean water and allowed to dry to gain maximum benefit. The sealant shall be applied as described for new floors.

General
The Contract shall be responsible for protecting the Works until the requisite drying/curing time has been achieved. No additional payment shall be made protection of the Works.

Waterproofing

Description
The Works shall include the application of a cold applied, waterproofing polyurethane system to provide a continuous waterproof coating over concrete, primed wood or primed metal surfaces.

Materials

For the purpose of sealants described in this section, Vulkem 350/351 shall be used.

The Contractor May propose alternative products he intends to use in the Works and shall submit to the Engineer for approval full information on these products. All products shall have no adverse effects on potable water. Products named in this section are an indication of the standard type and workmanship of goods which are satisfactory to the Engineer. The Contractor May use named products or equivalent other products after the approval of the Engineer in accordance with the Specifications, Conditions of Contract and with the manufacturers specifications.

Physical Properties

Property	Test Method	Vulkem 350 Base Coat	Vulkem 351 Top Coat
Tensile	ASTM D-412	320 psi (2.21 MPa)	3000 psi (20.7 MPa)
Elongation	ASTM D-412	1040%	140%
S_{100}	ASTM D-412	60 psi (414 kPa)	2200 psi (15.2 MPa)
Hardness	ASTM-C661-83	20	75
Peel Strength (On Concrete)	ASTM C-794	30 lbs (133N) 100% cohesive	(100% cohesive to Vulkem 350

Permeability	E-96	0.12 metric perms	0.06 metric perms
Non Volatile Content	ASTM D-1353	79% min.	63% min
Viscosity, cps	Brookfield HBT	8-10,000	2 – 3,000
Cure Time @ 77°F (25°C)	ASTM D-1640	48 hrs. max.	24 hrs. max
Flash Point	Setaflash	112°F (44.4°C)	82°F (27.8°C)

Execution

The waterproofing system shall be applied in accordance with the Manufacturer's instructions where the application procedure differs from the guidelines outlined in this section. The concrete shall be water cured and in place for a minimum of 14 days (preferably 28 days) prior to the application of the waterproofing system.

All concrete surfaces shall be finished using a light steel trowel followed by a fine hair broom or equivalent finish.

New or existing slabs shall be dry, clean, sound and free of all contaminates which May interfere with adhesion and proper curing. Chemical and/or mechanical surface preparation May be required. No separate payment shall be made for chemical and/or mechanical preparation of the surface to receive the waterproofing system.

The Vulkem 350 base coat shall be squeegee applied at a rate of 40 square feet per gallon, followed by back rolling to evenly distribute the material.

The Vulkem 350 base coat shall be allowed to cure to firm rubber before application of the top coat.

The Vulkem 351 topcoat shall be applied at a rate of 100 square feet per gallon using a medium nap roller. 4-6 lbs per gal of silica sand shall be immediately broadcasted into the wet topcoat and back rolled to evenly distribute the aggregate.

4.0 CONCRETE BLOCK WORK

4.1 Description

The work to be completed in this section shall include the furnishing and laying of concrete blocks, placement of reinforcing steel and loading of blocks with concrete. Reinforced concrete works shall be consistent with specifications # 3&4.

4.2 *Materials*

a) Cement and water

Cement and water shall be as described under "Concrete and reinforcing steel".

b) Sand for Mortar

Sand shall be clean naturally occurring plastering sand free from salts, organic matter, clay, loam, dirt or other deleterious matter and shall conform to BS 1200. All sand shall be stored and kept free from contamination by any other material.

c) Mortar

Cement mortar shall consist of one part by volume of Portland cement and three parts by volume of natural sand. The components shall be thoroughly mixed in the dry state, and then water added to achieve the desired workability. Cement mortar shall be mixed in small quantities as and when required, and any mortar that has begun to set or which has been mixed for a period in excess of one hour shall be rejected. The sand shall be clean; double washed fine sand sourced from a reputable wash plant.

d) Concrete Blocks

Concrete blocks shall conform to B.S. 6073 Part 1 of first quality good, sound, hard and well cured and true to shape and size of the types described with surfaces free from laitance and honeycombing.

Load bearing blocks shall have an average crushing strength (average of five units) of not less than 7N/mm^2 measured over the gross area. Concrete masonry units shall be tested in accordance with ASTM C-140. The Contractor shall allow for testing 5 random units, prior to commencement of the job. The units shall be selected in the presence of the Manufacturer's representative and the Employer's representative.

No dimensions shall differ by more than 3 mm. from the specified standard dimension. "Standard Dimensions" refer to the manufacturer's designated dimensions and are not to be confused with "nominal dimensions" of modular size units which are equal to the standard dimensions plus 10mm. the thickness of one standard mortar joint.

Minimum face-shell thickness and web thickness shall be specified below:-

Nominal Unit Width	Minimum Face-Shell	Web Thickness
150 mm	25 mm	25 mm
200 mm	31 mm	25 mm
250 mm	35 mm	28 mm
300 mm	38 mm	28 mm

Measurements shall be the average of 5 units taken at the thinnest point.

4.2.1 Workmanship

Laying Blocks

a) At the time of laying, all masonry units shall be free of excessive dirt and dust. Proper masonry units shall be used to provide a minimum of cutting. Where cutting is necessary, cuts shall be neat and true. Where masonry is to be bonded to a concrete beam or footing, the concrete surface shall be clean with laitance removed. Unless shown otherwise, blocks are to be laid in uniform courses with regular running bond.

b) Units shall be laid to preserve the unobstructed vertical continuity of the cells to be filled. Such cells shall be not less than 50 mm x 75 mm clear.

c) Mortar joints shall be straight, clean and uniform in thickness and shall be tooled as shown on the plans. Joints shall be tooled in a manner which compacts the mortar, pressuring the excess mortar out of the joint rather than dragging it out. The mortar shall be well bonded to the block at the edges. Tooling shall be done when the mortar is partially set but still sufficiently plastic to bond.

Where walls are to receive plaster or water-proofing agent, the joints shall be struck flush. Joints which are not tight at the time of tooling shall be raked out, pointed and then tooled. If it is necessary to move a unit after it has once been set

in place, the unit shall be removed from the wall, cleaned and set in fresh mortar. Joints shall be 10 mm thick unless specified otherwise and shall have full coverage of face-shells, webs and vertical ends.

d) Where reinforcement is used in horizontal mortar joints, the thickness of the joints shall be at least twice the thickness of the diameter of the reinforcement.

e) When hot, dry weather exists, units shall be wetted with a light fog spray, but not immersed into any vessel. The work shall be carried up course by course and no one portion shall be raised more than four courses at any time. All perpends and quoins shall be kept strictly true and square and carefully leveled through every second course. Build cross walls at the same time with main walls and properly bond together.

f) Tool joints of exposed block work which is not plastered for a depth of 20 mm before the mortar has set to form a flush joint and leave the edges of blocks well defined.

Grouting/ Concrete Loading

a) Where vertical reinforcement is specified or described, the reinforced cells are to be loaded with concrete for the full height of wall. Concrete shall consist of concrete mix 21 N/mm^2. Sufficient water shall be added to make a workable mix that will flow into all parts of the masonry cell without separation or segregation. The slump of the concrete should be in the region 75 mm. - 100 mm. Grout shall be placed before any initial set occurs and in no case more than 14 hours after water had been first added. Admixtures may be used subject to prior approval by the Employer.

b) Concrete shall develop a minimum compressive strength of 21 N/mm^2. at 28 days when tested as follows :-

1. Concrete shall be placed in a cell of a hollow concrete block of the type being grouted. The prism of grout so formed shall be separated and tested in compression in the same way as concrete test cubes except that any rough surface may require to be capped. For ease in separating the prism, the cell

may be lined with porous paper. A minimum of ten preliminary tests for each day on which grouting is undertaken.

2. Concrete shall not be placed to a height of more than 1 block course at one time and there shall be a minimum interval of 60 minutes between pours. When work is stopped for one hour or longer, the horizontal construction joints shall be formed by stopping all tiers at the same elevation with the grout 38 mm below the top. Concrete shall be compacted with a suitable pencil vibrator.

3. The final pour where a block wall is constructed to abut a fixed soffit shall be carried out through a chute fixed to the side of the wall so that grout may be poured up to soffit level.

The resultant surplus may be removed and cleaned off as soon as the grout has reached an initial set. After grouting, walls shall be hosed down to clean off scum and stains. No grout shall be placed until such time as the masonry mortar has sufficiently hardened to prevent "blow outs".

Reinforcement

a) Block walls generally shall have 'Brick force' reinforcement laid in the joints after every third course of block work in addition to any rod reinforcement as shown on Employer's drawings.
When a foundation dowel does not line up with *a* vertical core. It shall be stopped more than one horizontal in six verticals. Vertical reinforcement shall be held in position at the top and bottom and at intervals not exceeding 192 diameters of reinforcement. Vertical reinforcing steel shall have minimum clearance of 6 mm. from masonry and not less than one bar diameter between bars.

b) Wire reinforcement shall be completely embedded in mortar. Wire reinforcement shall be lapped a minimum of 225 mm. at splices and shall contain at least one cross wire of each piece of reinforcement in the lapped distance.

4.3 Measurement and payment

Work activities covered by this section shall include Reinforced concrete foundation block work and unreinforced block work for walls as shown in the drawings.

The rates shall include for the furnishing and laying of concrete blocks, furnishing and placement of reinforcing steel and furnishing and loading of blocks with concrete. Reinforced concrete work shall be in accordance with specification #3&4.
The rates shall include for the furnishing, mixing and placement of mortar, formwork and all else required to complete the activity as shown in the drawings**.** The unit of payment shall be as indicated in the bills of quantities.

5.0 BACKFILLING

The work to be considered under this section includes the furnishing, placement and compaction of selected backfill in the areas indicated in the drawings.

5.1 Materials

Selected granular fill material shall consist primarily of stone, sand, gravel or other acceptable material as specified in the bill of quantities. All of the material shall pass the 50mm square sieve, not more than 40% shall pass the no.40 mesh sieve and not more 10% by a weight shall pass the n.200 mesh sieve. The soaked C.B.R. shall not be less than 25. Where sand fill is specified it shall be approved backfilling sand sourced from a reputable quarry. Where boulders are used the Engineer shall specify the type and sizes required.
All backfilling material shall meet the approval of the engineer prior to employment in the works.

5.2 Workmanship

Compaction of fill material shall be carried out in layers not exceeding 100mm. The fill shall be of optimum moisture content so as to attain a dry density of at least 95% of the maximum density on compaction.

Compaction plant shall meet the approval of the engineer. Appropriately sized plate compactors or hand held rammers may be used.
The surface of the filled area shall be to the line and grades shown in the drawing and established by the engineer.

5.3 Measurement and payment

Work activities to be considered under this section include the backfilling under floor slabs and the aprons. The rates shall include for supplying all the labour, materials, tools and equipment for the furnishing, placement and compaction of selected fill material in the areas indicated in the drawings. The unit of payment shall be as indicated in the bills of quantities.

6.0 FABRICATION

6.1 Description

The Contractor shall supply all labour, materials, tools, plant etc. for fabricating, shop painting, transporting, handling and erection of all structural steel and burglar proofing as per drawings and as specified hereinafter or as directed by the Engineer. The scope shall generally include, but may not be limited to, the following itemized activities:

(a) Fabricating, shop painting, transporting and erecting heavy steelwork in base plates, columns, rafters, wind bracing, tie beams and Steel burglar-proofing gates. Fabrication shall include for base and connection plates, gussets, cleats, bolt holes, welded frames and hinges and all else shown in the drawings.

(b) Grouting under column base plates.

All activities shall be deemed to be inclusive of cutting tying bolting, welding, painting all complete and as shown in the drawings. All structural steel members shall be primed with 2 coats of red oxide primer and painted with 2 coats approved gloss paint.

6.2 Materials

Structural Steel shall comply with the requirements of BS 449: Part 2 and BS 4360. In addition, structural steel hot rolled sections and structural steel hot-rolled hollow sections shall comply with the requirements of BS 4, BS 4848 and ASTM A-370. Galvanized steel pipes shall be schedule 40 thickness and sourced from a reputable supplier.

(a) Structural Steel bolts and nuts shall comply with the requirements of BS 153: Part 1 and either BS 3692 or BS 4190.

(b) Plain and tapered washers other than for high strength friction grip bolts shall comply with the requirements of BS 440: Part2 and BS 4320.

(c) Bearing plates and anchor bolts for the building structures shall comply with ASTM Specification Designations A-36.

(d) Welding electrodes for manual metal-arc welding for grades of steel to BS 4360 shall comply with the requirements of BS 449: Part3 and BS 639. Weld material deposited by an automatic or semi-automatic process shall comply with the requirements of BS449: Part 2.

(e) 6.3 Construction Requirements

6.3.1 Fabrication or Shop Drawings

The Contractor shall carry out fabrication strictly in accordance with the steel fabrication drawings provided by the Employer. The Contractor shall check all fabrication drawings and report all defects to the Employer prior to commencement of the fabrication works.

6.3.2 Fabrication

All components shall be fabricated strictly as per approved drawings and in accordance with the recommendations of AISC and AWS. All tolerances, allowances and edge distances shall be as per ASIC specification or other relevant standards. All welding shall be done certified, tested, experienced welders.

Unless noted otherwise and consistent with transportation and handling facilities, all shop connections shall be welded, and all site connections shall be bolted. All splices shall develop the full strength of the member.

All members shall be from continuous sections. All joints shall have prior approval of the Engineer

Edge preparation for welding, welding electrodes, welding equipment and procedure shall comply with the AWS specifications and shall be subject to inspection. All defective welds, as indicated by the Engineer, shall be rectified by the Contractor without any extra cost to the Employer.

Holes shall be drilled. Punching, where used, shall be followed by reaming. Torch cut holes shall not be permitted under any circumstances whatsoever. Holes and openings for other works shall be provided. Gas cutting of edges shall be avoided in preference to sheared edges. All gas cut shall be filed or ground or edge-planed.

Ends of all hollow sections (RHS or pipe) shall be thoroughly sealed by plates and continuous welds.

Where hollow section pipes are connected; such connections shall be by welded joints only. Pipes shall not be joined by threaded ends.

6.3.3 Inspection

All fabricated steel and fabrication process shall be subject to inspection. The Contractor shall submit a schedule of his fabrication activity to the Engineer so that he could work out his inspection program selectively. Generally, the inspection shall be done in the following order:

(1) Inspection of raw materials, preparation and procedures.

(2) Inspection after members are cut, drilled and edges are prepared for welding.

Materials or workmanship that are not in conformity with the specifications shall be rejected and shall not be allowed to be transported to the site or, if they are fabricated or already transported to the site, shall not be allowed to be erected.

6.4 Shop Painting

Upon completion of fabrication, all steel components shall be cleaned by wire brushing or other approved means to remove all dirt, grease, mill scale, rust, paint marks, stains etc. complete. Immediately after cleaning, one coat of paint shall be applied unless specified otherwise. Paint shall be Zinc Chromate Primer or as

specified in the bill of quantities and shall be applied within eight hours of cleaning operation.

All threaded parts shall be coated with grease and shall be protected from transit damage. Similar treatment shall be done for machined or milled parts.

6.5 Transporting and Handling

All materials shall carry identification marks matching with the drawings and direction marks, N-S-E-W, up etc. For ease of erection. If long members need to be handled from specific locations, such locations shall be identified on drawings and on members.

Transportation and stacking of materials shall be in order of erection and shall consist of matching components. All the materials dispatched from the shop shall be received at the site only in the presence of the Contractor's representative who shall arrange for its unloading in the area allocated for the purpose. If corrective works are required to be undertaken to any fabricated member, this shall be done at the Contractor's expense as directed by the Engineer. Alternatively, the Contractor may choose to have the corrective works carried out in the shop.

6.6 Erection

Prior to preparation of the fabrication drawings, the Contractor shall check and record the levels and alignment of supports and location of the anchor bolts and shall notify the Engineer of his findings. If remedial works cannot be done to the foundations, the Contractor shall make the necessary adjustments to the steel members in accordance with the Engineer's direction. The cost of such rectification shall be borne by the Contractor if the defects were found prior to commencement of fabrication works. All pockets around anchor bolts shall be cleaned thoroughly of all debris after levelling plates are installed and before columns are erected. All erection works shall be stable under their own weights, incidental erection loads and wind loads. All erection works shall be in correct sequence so as to ensure stability and safety. No modification to any component shall be done to achieve fit without the knowledge or permission of the Engineer. Flame cutting to enlarge holes shall not be permitted. The Engineer may permit enlargement of holes by use of drift pins and

using oversized bolts. Bolting of heavy or heavily loaded members should be done only after they are jacked to snug fit and pre-calculated tension shall be applied by calibrating torque wrenches or by turn-of-nut method as per AISC specification. After plumb has been checked, all anchor bolts shall be tightened and all bases shall be grouted.

6.7 Grouting

All loose material from under the base and from pockets around bolts shall be removed by compressed air or other approved method and shall be washed clean by water jet. Approved non-shrink cementitious grout (Five Star or M-Bed or equal) shall be installed under the base plate and around bolt pockets so as to fill the space completely and providing full bearing of the base plates. Mixing and placing of the grout shall be carried out strictly in accordance with the Manufacture's printed instructions.

6.8 Final painting

After the erection is completed, all parts where shop paint has been removed due to transportation, storage, handling and erection or otherwise, shall be touched up.

6.9 Measurement and payment

The work activities to be covered by this section shall include structural steel works such as columns, rafters, tie beams and bracing.

The rates for items in this section shall include for:

a) Fabricating, shop painting, transporting and erecting structural steelwork. Fabrication shall include for all base and connection plates, gussets, cleats, bolt holes and all else shown in the drawings.

b) Grouting under column base plates

The rates for all activities shall be deemed to be inclusive of all the cutting, tying, drilling, bolting, welding, painting and all else required to complete the job in

accordance with the drawings. The unit of payment for each activity shall be as indicated in the bills of quantities.

7.0 Roof Construction

The works to be considered under this section includes the supply and installation of galvanized steel purlins, galvanized roofing sheets, galvanized ridging, sag rods and fascia, inclusive of all fabrication required, bolting and screwing etc and all else required to complete the job.

7.1 Materials

a) Structural steel shall be Grade 43. Galvanized pipe for roofing shall be schedule 40 and sourced from an approved supplier.

b) All metal roof coverings and ceiling shall conform to TTS 16 35 511:1988

c) Roof sheeting shall be 26-gauge, polyester pre-painted Aluzinc sheets (GGI-New Wave) or equivalent as approved by the engineer conforming to the colour and corrugation pattern indicated by the Engineer. Radiant barrier shall consist of 1 layer polyethylene bubble film between 2 layers of metalized film as per Astro Eco I brand.

d) Painting of all steel members shall include: -

i) Thorough cleaning and priming with one (1) coat of zinc chromate primer.

ii) Applying two (2) coats of gloss paint. The paint colour to be determined by the Engineer.

e) Fascia shall be 26-gauge Aluzinc sheets with 12" completed depth and shall conform to the colour of the roof.

Tenderers are required to provide a sample of the materials to be used which is subject to the approval of the engineer.

7.2 Workmanship

All structural steel work shall conform to B.S. 4360.

Protective Treatment and Painting

a) All steel surfaces, which are to be painted, should be dry and thoroughly cleaned to remove all loose scale and rust. Surfaces of exposed work which are to be held in contact by riveting or bolting, shall be painted before assembly and the parts brought together while still wet. All steelwork shall be shop coated with one (1) coat of zinc chromate primer. After erection, the steelwork is to be thoroughly cleaned to remove all oil or grease and touched up with the primer where necessary.

Bolts

a) All bolts, screws, nuts and washers shall be greased. When erected with the correct tapered or flat washers, bolts shall show two (2) clear threads beyond the nut and no threads shall bear upon the sections connected.

b) All bolts, nuts and screws shall comply with B.S. 916 and washers B.S. 3410.

Welding

a) All welding shall be carried out by an electric arc process and the plant and all welding procedures be subject to the approval of the engineer. Type of weld used should be fillet weld and should meet the approval of the engineer. All welding procedures shall conform to B.S. 5135.

Erection

a) All metalwork and down pipes are to be erected and bolted in accordance with the drawings. Roofing sheets shall be laid in continuous lengths as per drawing. Ridge capping and flashings shall be laid with, minimum laps of 150mm.

b) Sufficient ties and braces (either permanent members or temporary) shall be used to maintain stability during erection. During unloading, handling and erection operations, care must be taken to ensure that surface treatments are not damaged; Protective measures must be employed when using wire ropes and slings.

Laying

a) The finished product shall be clean in appearance with no surface contamination or defects and free from twist or buckle. Any curving of the sheets, if required after corrugation, shall not cause flaking of the painted coating or fracture of the sheet.

b) Ridge caps and flashing shall be laid with minimum 150mm laps.

c) All roofs are to be left clean and watertight at completion and to the satisfaction of the Employer.

Any work found defective and not in accordance with the drawings and specifications shall be rejected and must be at once made good at the expense of the contractor.

7.3 Measurement and payment

The works activities to be considered under this section includes the supply and installation of galvanized steel purlins, galvanized roofing sheets, galvanized ridging, sag rods and fascia.

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The rates for all activities shall be deemed to be inclusive of all the cutting, tying, drilling, bolting, welding, painting and all else required to complete the job as shown in the drawings. The unit of payment for each activity shall be as indicated in the bills of quantities.

8.0 CONSTRUCTION OF CONCRETE LINED AND INVERT DRAINS

Curb and Slipper, Swale, Box drain and Cascade Drain

8.1 Description

This work shall consist of the construction of cement concrete lined curb and slipper, swale and cascade drains in accordance with these specifications and in conformity with the locations, lines, grades and dimensions shown on the plans or as ordered by the Engineer

8.2 Specifications

1. Concrete used shall be of grade 20 i.e characteristic strength of 21N/mm$^{2.}$ Concrete shall be furnished, placed and compacted in accordance with specification # 3.

2. BRC used shall be #65 gauge.

3. Reinforcing bars shall be corrugated, high yield steel.

4. Concrete blockwork shall be in accordance with specification #4

8.3 Work Methods

1. Excavate along lines (as mentioned above), removing all slush and soft material.

2. During excavation ensure that the required grade is provided and that the bottom of the excavation is formed on compacted ground, not easily susceptible to erosion.

3. Place and compact a 6" (150 cm)) sand blinding layer at the base.

4. In the case of swale and slipper drains, prepare formwork, place BRC and pour concrete to form the drains as shown in the drawings

5. Curbs and slipper, swale and cascade drains should be evenly shaped and smoothened.

6. For box drains, after placing and compacting the sand blinding layer, prepare formwork, place reinforcing bars and pour concrete to form the drain base as shown in the drawings. Reinforcing steel shall be placed in the form of a continuous U shape with reinforcement extending for drain wall construction.

7. Construct drain walls for box drain in accordance with the drawings.

8. Backfill behind drain walls in accordance with specification # 5 and restore roadway as instructed by the engineer.

8.4 Construction of Invert Drains

8 4.1 Description

The work to be performed under this section consists of supplying and installing precast concrete inverts of the classes, sizes and dimensions required, furnished and installed at such locations as are designated on the drawing or by the engineer in accordance with these specifications and in conformity with the lines and grades given.

8.4.2 Specification

The inverts to be used must be of size 60 cm x 30 cm x 90 cm. or as specified by the engineer. The inverts shall be sourced from a reputable supplier that has been approved by the engineer.

8.4. 3 Work Method

1. During excavation, ensure that the required grade is provided.
2. If necessary, build back up to the required level using a sub grade material as authorized by the engineer and compacting in 100mm layers.
3. Compact the excavated area using mechanical or manual means before placing the inverts.
4. Begin invert laying at the downstream end of the culvert with the bell or groove ends facing upstream. Ensure that each invert fits snugly into the other.
5. The grade of the drain shall comply with that given above under earthen drain

6. Backfill behind inverts in accordance with specification #5 and restore the surrounding area as instructed by the engineer.

8.5 Measurement and Payment

1. The unit of measurement for payment shall be the number of metres of new drains constructed and approved

2. Payment will be made at the prices tendered for the item under this section as it appears in the schedule. The prices and payment shall constitute full compensation for excavating, compacting, removal of waste, equipment, materials, labour, tools and all else necessary to complete the work described herein in strict conformance with these specifications, and any Special Conditions of Contract and as approved by the Engineer

9.0 TILING

9.1 Materials

Ceramic and Porcelain Tiles

a) Tiles shall be glazed ceramic or porcelain tiles as indicated in the drawings and bill of quantities.

b) Floor tiles shall be slip-resistant and meet PEI class III grade. Floor tiles shall be a minimum of 0.3m x 0.3m. for ceramic and 0.6mx0.6m for porcelain.

c) Wall tiles shall meet PEI II grade. Wall tiles shall be either 0.3m x 0.55m or 0.3m x 0.6m and shall conform to the colour of the floor tile. This size may be changed based on availability and shall meet the approval of the Engineer.

d) Tiles shall be of a uniform colour and pattern and shall be approved by the Engineer.

Grout

a) Grout spacing shall be 5mm on floors and 3mm on walls.

b) Grout shall be fine textured sanded grout. Texture and colour shall meet the approval of the Engineer. The Engineer shall approve the use of non-sanded grout where necessary.

Grout sealer

a) Shall be silicone based standard commercial quality.

Thinset

a) Shall conform to requirements for dry-set mortars found in ANSI A118.1 1985. Porcelain thin set mortar shall be used for installation of Porcelain tiles.

Tenderers are required to provide a sample of the materials to be used which shall meet the approval of the engineer.

9.2 Workmanship

Surface Preparation

All surfaces to be covered must be clean and free of dust, oil, grease, curing compounds, sealers, loose or scaly materials, and other foreign matter. Cracks and holes shall be filled with approved masonry filler. Drywall compound or fillers shall not be used on surfaces to be tiled.

Installation of tiles

Installation of tiles shall meet A108.1A standards. Traffic should be kept off the installation for 24 hours.

Grout application

Slaking shall be allowed for a minimum of 8 minutes before application of grout. Grout shall be finished smooth and tile surface shall be free from grout residue. Grout shall be cured for a period of five days before application of the grout sealer to allow for proper curing. Grout sealer shall be applied to all grout surfaces.

Any work found defective and not in accordance with the drawings and specification shall be rejected and must be at once made good at the expense of the contractor.

10.0 WINDOWS AND DOORS

10.1 Description

The work to be performed under this section consists of supplying and installing of complete windows and doors of the classes, sizes and dimensions required, at such locations as are designated on the drawings and the bill of quantities or by the engineer in accordance with these specifications and in conformity with the lines and grades given. Specifications for wood cabinetry shall be considered covered under the specifications for wood doors.

10.2 Materials

Windows

a) All windows shall be Slider type UPVC Aluminium framed windows as specified on the bill of quantities and drawings or equivalent, as approved by the Engineer. The windows shall be provided with steel burglar-proofing, stays, hinges, handles, locking devices, glazing and all other accessories.

b) All frames shall be free from corrosion, bends, kinks, and other defects. All welding shall be ground smooth and all welds shall be continuous. Steel frames shall be securely fastened to the wall with steel crabs welded to the frame. UPVC windows shall be installed using appropriate wall anchors as prescribed by the manufacturer.

c) Glazing shall be ¼" thick bronze glass fixed to the frame. After installation, the entire window shall be watertight.

d) Upon completion, all frames and glass shall be cleaned of all foreign matter such as putty, cement, mortar and all else.

Doors

a) Wooden doors shall be made from first grade Cedar and shall be treated for termites and other wood destroying pests. All doors shall be sourced from a reputable supplier as approved by the Engineer and should be completely finished.

b) Wooden doors and trim shall be treated to one (1) coat sanding sealer, one coat primer and two coats semi-gloss varnish.

c) All steel doors shall conform to standards stated for structural steel fabrication and as described on drawings provided.

d) All steel door panels shall be manufactured from galvannealed ZF 75 zinc coated per ASTM A653.

e) Steel doors shall be treated to one (1) coat zinc chromate primer and two coats polyamide epoxy enamel or marine grade paint as specified. Jotun brand primer and paint or as approved by the Engineer.

f) Doors shall be fitted with ¼" thick bronze glass where necessary.

g) All wooden doors shall be mounted on heavy duty aluminium door frames. All steel doors shall be mounted on steel frames.

h) Internal doors shall be fitted with cylindrical locks and all external doors shall have deadbolt locks as well as cylindrical locks. Keys for locks shall be handed over to the client immediately after installations.

i) Composite metal and Glass doors shall be sourced from a reputable supplier that has been approved by the engineer.

All Materials are to meet the approval of the Engineer.

10.3 Workmanship

a) The contractor shall verify that masonry opening is correct and sill plate is level before window is installed. Where necessary, the dimensions of existing window frames shall be adjusted to facilitate the installation of new windows. Such alterations shall be consistent with section 4.2 and shall be included in the price for window installation.

b) Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris. All masonry work required for installation of windows and doors shall be carried out as per specification 4.2.

c) All doors and windows shall be set plumb, level and true to line and without warp.

d) Where use of marine grade primer and paint is specified, application shall be by spray painting using a pneumatic sprayer.

10.4 Measurement and payment

The rates for all activities of supplying and installing of complete windows and doors of the classes, sizes and dimensions shown in the drawings.

The rates for windows shall include for all priming, painting, and masonry works necessary for complete installation. It shall further include for the supply and installation of steel burglar-proofing, stays, hinges, handles, locking devices, glazing and all other accessories

The rates for doors shall include for the supply and installation of door frames, locks and doors. It shall further include for the supply and installation of stays, hinges, handles, locking devices, glazing and all other accessories

11.0 ELECTRICAL

11.1 Description

(a) The electrical works shall include but not be limited to electrical panels, breakers, electrical supply cable, glands, brackets, clamps, tape, cable trays, conduit, builders' works and terminations as detailed in the Bill of Quantities. The intent of the works is to provide for the completion in every detail of the electrical installation unless otherwise stated. This includes (but not limited to) all labour, superintendence, materials, tools, equipment, storage, certificates, temporary work, inspection, testing, accessories, auxiliaries and incidentals necessary to complete the works in a proper, safe, thorough and skilful manner.

The specific items shall include but not be limited to:

(b) The provision of all material and labour, necessary equipment and services to complete the electrical installation as specified in this tender document.

(c) Installation of new complete P.V.C Conduit System for building or additional conduit as required.

(d) Pulling of s/s cables, for termination boxes, outlets, switches, breakers, lights.

(e) The installation of electrical fittings, outlets and switches, with new commercial grade type as specified in the Bill of Quantities.

(f) Chasing of wall, masonry works, painting and finishing where necessary as instructed by the Electrical Engineer in charge.

(g) Testing, commissioning and energizing of the new electrical system.

(h) Inspection of the entire installation by the Government Electrical Inspectorate and acquisition of a Permanent Electrical Inspection Certificate that is valid for five (5) years.

i) It is the intention of the Specifications and Drawings to call for finished work, tested, and ready for operation.

(j) Minor details not usually shown or specified, but necessary for proper installation and operation shall be included in the contractor's quotation.

(k) Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered and installed by the contractor without additional expense to the client.

11.2 Materials

Equipment shall be designed, manufactured and tested in conformance with the applicable standards of:

ANSI - American National Standards Institute
NEMA - National Electrical Manufactures Association
IEEE - Institute of Electrical and Electronics Engineers
ASTM - American Society of Testing and Materials
IPCEA - Insulated Power Cables Engineers Association
BS - British Standards

Evidence of electrical equipment shall require labeling by Underwriters Laboratories (UL) or Canadian Standards Association (CSA) or approved equivalent test laboratory.

11.3 Workmanship

Codes, Permits, etc.

Unless otherwise specified, the Contractor shall carry out all construction work and install materials and equipment in full accordance with the latest applicable rules, regulations, requirements and specifications of the following:

- Local Laws and Ordinances
- Trinidad and Tobago recommendations for electrical wiring of buildings.
- IEEE regulations for electrical equipment of buildings.
- NFPA Publication 70 – National Electrical Code (N.E.C.)
- Regulations of Trinidad and Tobago Electricity Commission.

Conflicts, if any, that may exist between the above items and the conditions described in the drawings and these Specifications shall be brought to the attention of the Employer.

Grounding

a) Grounding cables shall be of bare, stranded copper, unless otherwise indicated.

b) Permanent and effective ground connections shall be provided by separate ground wires for all metal cases of supporting frames of electrical equipment such as:

- Equipment enclosures
- Structural framing
- Lighting and power panel enclosures
- Luminaries
- Switches and receptacle boxes

c) The identified neutral wire of the interior wiring system shall be permanently grounded. The grounded wire shall be connected to the supply side of the main circuit breaker and soldered to an approved ground clamp and securely bonded to driven copper rods. The size of the ground connectors shall be in accordance with the codes.

The conductors shall be protected from mechanical injury by rigid steel conduit to which the conductors shall be securely bonded. Conduit system as well as wire armour of cable shall be securely grounded to the above described wiring system. The whole system shall be connected to driven copper

d) Ground electrodes shall be a minimum of ⅝" in diameter copper clad steel rods 8 feet long.

Electrodes shall be buried at a depth of not less than 8 feet.

Conduit System

a) The conduit systems shown on the construction drawings shall consist of electric metallic tubing (E.M.T.) or as stated in the bill of quantities.

b) All conduits installed below grade shall be Class D PVC pipe. Where concealed in partitions, furred spaces, ceilings, and in concrete slabs, wiring may be installed in E.M.T.

c) The minimum size of conduit permitted shall be ½" (12mm).

d) Conduit cut in the field shall have ends cut square with hand or power hacksaw, or approved pipe cutter. Cut ends shall be reamed to remove burrs and sharp edges.

e) Conduit joints shall be made with approved couplings and change in direction shall be done with bends made by hickey or power bender, standard elbows and offsets, conduit fittings or pull boxes. Bends and fittings shall not be used together. Conduit elbows, offsets and bends shall be made without kinking or destroying the cross sectional contour of the conduit. All joints shall be brought to a shoulder, finishing butt to butt in the couplings. Conduits at joints shall be made light with standards couplings.

f) All conduits shall be securely attached to hangers or to a solid surface with the maximum spacing of the points of support as specified in the NEC code.

g) Fastening conduit runs shall be by means of conduit one-hole pipe straps or beam clamps. Perforated straps shall not be used.

h) Conduit terminals at outlets, boxes and cabinets shall be provided with double locknuts and insulated bushings unless otherwise indicated.

i) All embedded conduit runs shall be cleaned and swabbed to remove all foreign matter and moisture prior to pulling in wire or cable.

j) All boxes in which conduits terminate shall be cleaned of all concrete, mortar and other foreign matter and all threads shall be left clean and true upon completion of the works.

k) All conduit where they enter panel board or pull boxes shall be brought up securely and perpendicular to the box surface.

Outlet Boxes

a) Each luminaire, switch, receptacle and/or other outlet shall be provided with a suitable outlet box, approved and suitable for the particular area in which it is to be installed.

b) Outlet boxes shall be supported independently of the conduit or cable and shall provide adequate support for the equipment or device to be mounted in it or suspended from it.

c) Gang boxes shall be used at locations where more than one device is to be mounted, such as switches or duplex outlets.

d) Outlet boxes shall be, of the depth necessary to accommodate the number of wires contained therein.

e) Standard outlet boxes shall be manufactured from galvanized sheet steel.

f) Outlet boxes installed outside the building and/or in damp locations shall be weatherproof type. If in direct contact with the ground, they shall be made of cast iron or cast aluminium.

g) Pressed steel outlet boxes will be permitted in the construction. All outlet boxes shall be at least 1½" (38 mm) deep, single or ganged of proper code size to accommodate the devices noted. The outlet box shall be complete with the approved type of connectors and required accessories such as ears, studs, cable clamps and covers.

h) Outlet boxes must be securely fastened in position with the exposed edge of the raised device cover set flush with the finished surface. Approved

factory-made, knock-out seals shall be installed where knockouts are not intact.

i) Outlet boxes for exposed work shall be utility (handy.) boxes with utility box covers unless otherwise noted.

j) All flush or surface mounted exterior outlet boxes and all interior surface, mounted ceiling and wall outlet boxes shall be galvanized or cadmium plated cast iron or malleable iron conduit boxes, threaded for conduit connections. Covers shall be water tight type complete with gasket. Where rows of ceiling outlets occur, special care shall be exercised regarding alignment of such outlets.

Wall Boxes

a) Outlet boxes for wall receptacles; both telephone and power shall be mounted 18" above the finished floor (AFF) unless otherwise noted. When the receptacle is mounted on a masonry wall, the bottom of the outlet box shall be in line with the bottom of a masonry unit.

b) All receptacle outlet boxes shall be equipped with grounding lead which shall be connected to grounding terminal of the device.

Switch Boxes

a) Outlet boxes for switches shall be mounted 5 feet above the finished floor (AFF) unless otherwise noted and shall be located on the strike side of the doors as finally hung, whether so indicated on the plans or not. When the switch is mounted in a masonry wall, the bottom of the outlet box shall be in line with the bottom of a masonry unit.

b) When more than two switches are located, the switches shall be mounted in a gang outlet box with gang cover. Dimmer switches shall be individually mounted unless otherwise noted. Switches with pilot lights, switches with overload motor protection, and other special switches that will not conveniently fit under gang wall plates shall be individually mounted.

Ceiling Boxes

All lighting fixture outlet boxes shall be furnished with the necessary accessories to install the fixture. The supports must be such as not to depend on the outlet box supporting the fixture. The supports for the lighting fixture shall be independent of the ceiling system. All ceiling outlet boxes shall be equipped with raised, circular cover plates with edges set flush with surface of finished ceiling.

Junction Boxes

Where indicated on the plans, and where necessary to terminate tap-off or redirect multiple conduit runs, the electrical contractor shall furnish and install appropriately designed junction boxes. Boxes shall be fabricated from galvanized sheet steel and shall have full-access screw covers mounted with corrosion-resistant machine screws. Covers shall be for flush or surface installation as noted

a) Boxes shall be as required by the NEC for the number of conduits and conductors entering and leaving it. Where intermediate cable supports are necessary because of box dimensions, provide insulated, removable cross-brackets to support the conductors as required by NEC and local code. Where feeder splices are to be -made, boxes shall be large enough to provide ample work space. Boxes shall be supported independently of conduits entering them. Brackets, cod hangers, bolts or other approved supporting methods shall be used.

Pull Boxes

a) All pull boxes shall be constructed of galvanized sheet steel, the dimensions of which shall not be less that NEC requirements and shall be increased if necessary for practical reasons or where required to fit a job condition.

b) Furnish and install pull boxes where necessary in the raceway system, whether indicated on the drawings or not, to facilitate conductor installation.

In general, conduit runs of more than 12 m or with more than three 90 bends, shall have a pull box installed at a convenient intermediate location All such pull boxes shall be indicated on the contractor's shop drawings.

c) Boxes shall be securely mounted on the building structure with supporting facilities independent of the conduits entering or leaving the boxes. Where boxes are used in connection with exposed conduit, plain covers attached to the box with a suitable number of countersunk flat head machine screws shall be used.

d) Where so indicated, certain pull boxes shall be provided with barriers. These pull boxes shall have a single cover plate, and the barriers shall be of the same gauge as the pull box.

Low Voltage Conductors

a) PVC insulated conductors in E.M.T conduit shall be used or PVC armoured cable in the larger sizes with 600/1000 volt rating unless otherwise noted. No wire smaller than 2.5 mm^2 shall be used except for signal control circuits. All receptacles circuits shall be wired 4.0 mm^2 conductors unless otherwise scheduled or noted. All lighting circuits shall be wired with 2.5 mm^2 wire for circuit runs of less than 100 feet, 4.0 mm^2 wire shall be used for longer runs in all cases limiting the voltage drop from panel board to furthest outlet to within 2½%.

b) At least 8" of slack wire shall be left in every outlet box whether it be in use or left for future use.

c) All conductors and connections shall be test-free of grounds, shorts and opens before turning the job over to the Employer.

Lighting

All lighting fixtures shall be 120V X 23W.LED light bulbs with receptacles or as described in the bill of quantities. Housing shall be of pre-painted non-corrosive metal frame. All switches shall be recessed type, two-way toggle switches with plastic covers.

12.0 PLUMBING

12.1 Materials

a) P.V.C. pipes and fittings shall conform to B.S. 3505 (1968 Rev 1975) or B.S. 3506 (1969 Rev 1975).

Codes, Permits, etc.

a) All materials furnished and work done shall comply with the Trinidad and Tobago plumbing code.

b) The contractor shall give necessary notices, file all plans, obtain all permits and pay all fees or other costs in connection with this work, and shall obtain all certificates of Inspection which he shall deliver to the Employer.

12.2 Workmanship

a) Plumbing installation shall be carried out by licensed craftsmen to the satisfaction of the Engineer.

b) The Contractor shall test the whole of the plumbing installation during the progress of the works, in the presence of and to the satisfaction of the Engineer and the Water and Sewerage Authority before filling in of excavations and again on completion and leave the system sound and water tight.

12.3 Measurement and payment

The rates in this section shall include for all the necessary labour, materials, pipework, fittings fixtures, tools and equipment and all else required to complete the job. The rates for specific work items shall include for the supplying and installation of the following:

13.0 PAINTING

13.1 Materials

a) All materials used, unless otherwise stated, shall be anti-fungus and lead free. Antifungal primers shall be Berger ALD concrete primer or other as approved by the Engineer.

b) Internal paints shall be Berger interior emulsion and Berger 404 paints or equivalent brand as approved by the engineer.

External and oil paints shall be Berger Weatherproof Ultra exterior paint and oil paint or equivalent brand as approved by the engineer.

c) Paints shall be supplied on site in sealed cans that show at the time of use the designated name, formula, colour, date of manufacture, manufacturer's directions and name of manufacturer.

d) Pre treatments for surfaces to be painted shall be Berger sterilizing solution or other as approved by the Engineer.

e) Patent or masonry fillers shall be approved by the Engineer prior to use.

f) All mixing etc. shall be in accordance with the manufacturer's instructions. No paint is to be thinned.

g) Vouchers shall be produced as and when required by the Employer to prove to his satisfaction that all materials supplied are genuine and as specified herein.

13.2 Workmanship

a) All surfaces to be painted shall be clean and free from rust, dust, cracks, stop holes, grease, grime, droppings and laitance.

b) Paint shall be applied by brush or roller undiluted, or spray with the minimum of dilution as per manufacturers recommendations.

c) Paint shall be free from skins and similar impurities before application.

d) Each coat of paint shall be allowed to dry completely and well rubbed before the next is applied. No two successive coats shall be to the same tint.

e) On no account are Employees to empty washings or painting materials into sanitary fittings or drainage systems, therefore the Contractor shall provide a suitable receptacle outside the building to receive same.

Masonry surfaces

a) Masonry surfaces shall be prepared for painting by allowing drying for at least 24 hours and removing all mortar splashes by rubbing with a pumice or flat stone and thoroughly brushing to remove dirt.

b) Surfaces shall be primed with one coat of emulsion primer and allowed to dry. All cracks, holes etc. shall be filled with patent filler which shall be allowed to set before sanding to a smooth finish before the application of subsequent coats of emulsion paints.

c) A minimum of two (2) coats of emulsion paint should be used.

Metal surfaces

a) All steel surfaces shall be cleaned to remove all traces of rust, dust, oil and grease. Include for use of commercial rust removers and degreasers.

b) Zinc chromate primer shall be applied to all areas that are not properly primed. Marine grade primer (Jotun Brand) shall be used where marine grade paints are specified.

c) All exposed glass surfaces shall be covered before application of paint to steel surfaces.

d) Glass surfaces shall be left clean and free of all paint and other residues.

e) A minimum of two (2) coats of emulsion paint shall be used.

15.0 Gypsum Ceiling

15.1 Description

The works to be completed in this contract consist of the following activities:-

a) Removal of existing ceiling and frame-work.

b) Supply and installation exposed ceiling grid system.

c) Supply and installation of 610mm (2ft) x 610mm (nominal size) gypsum ceiling tiles or as stated in the BOQ/Drawings.

d) Provision for lay in light fittings.

15.2 Materials

Metal frame

a) Frame shall be made of galvanised wall angle 25mm x 25mm x 0.06 / 0.8.mm secured to perimeter walls.

b) Grid shall be galvanised metal Tee's with 25mm face width supported at a maximum of 1.2m centre.

c) Suspension components shall be a minimum of 19mm wide x 0.8 mm galvanised hangers pop riveted or secured with wafer head Tek screws 4.5 mm x13.

d) Where pop rivets are used, they shall be steel not aluminium and with sheer strength 3 times that of the maximum allowed ceiling load. Two steel pop rivets 3.2mm x 2 to be fixed to the tee.

e) Hanger wires shall be 2.5mm or thicker.

Tenderers are required to provide a sample of the materials to be used which shall meet the approval of the Engineer.

Gypsum

a) Shall conform to B.S. 476.

b) Shall be dimensionally stable laminated gypsum 12mm or greater.

c) Shall be of uniform white colour and pattern and shall meet the approval of the Engineer.

d) Shall be mould and mildew resistant.

e) Shall be asbestos free.

15.3 Coordination of Work

The layout and installation of the ceiling and suspension system components shall be coordinated with other work penetrating the ceiling. This includes but is not limited to light fixtures and HVAC equipment.

A. Product Data: The Contractor shall provide product specifications and installation instructions for all supplied ceiling materials.

B. Shop Drawings: When required, the Contractor shall supply shop drawings outlining the placement of hangers and the location of carriers, and any other details necessary for proper installation.

15.4 Delivery, Storage and Handling

A. All materials shall be delivered to the project site in original, labeled, unopened packages.

B. Materials shall be stored flat and level in a fully enclosed space, preferably in the room in which they are to be installed.

C. Care in handling must be exercised to avoid damage.

D. Manufacturer: All materials supplied by the manufacturer shall be guaranteed against manufacturing defects for one (1) year.

15.5 Suspension System

The standard suspension shall consist of commercial grade steel with surface prepared, and galvanized. Hangers to support carriers shall be #12-gauge steel wire

Edges, borders, and perimeter trims shall be included in the rates for works under this section.

15.6 Workmanship

a) The suspension shall not be out of plumb (vertical) more than 25mm for each 150mm of plenum depth and in no case should exceed 500mm to a 3000mm depth.

b) When securing wires to tee it should be wound tightly around itself at least 3 times.

c) Lay-in light fittings shall be suspended at all four corners with hanger wires.

d) Appropriate frame clips shall be used to secure gypsum tiles in place.

e) Installation shall meet all other industry standards not covered in the specifications outlined.

Any work found defective and not in accordance with the specification shall be rejected and must be at once made good at the expense of the contractor.

15.6.1 Preparation

A. Ceiling Layout: The Contractor shall measure ceiling areas and establish layout of hangers and carriers, in accordance with installation instructions.

B. Coordination: The Contractor shall furnish the layout for supports that shall be installed for suspension of ceilings. He shall furnish concrete inserts, steel deck hanger clips, or similar devices for installation, in time to coordinate the work. The contractor shall coordinate with other trades the location of devices which will penetrate the Ceiling Panels or interfere with the installation. Recessed or surface devices located within the ceiling panels are to be located and cut in the field.

15.6.2 Installation

A. General: The Contractor shall install materials in accordance with the Manufacturer’s instructions. The installation will comply with applicable regulations and industry standards.

B. Perimeters: Using a leveling device, the Contractor shall layout and install perimeter trim, as specified.

C. Suspensions: suspension carriers shall be placed perpendicular to the desired ceiling panel direction, and positioned on 3' or 2’ centers – or as specified by the manufacturer.

Carriers shall be suspended from specified hangers - starting 6" from one wall, then on specified centers, with the last carrier positioned within 6" of the other wall.

Specified hangers shall be attached directly to structure, or to inserts, screw eyes, or other devices that are secure, and that will not deteriorate or fail with age or elevated temperatures.

D. HVAC and Light Fixture Suspensions: Electrical and mechanical installations shall be supported independently of the ceiling.

15.6.3 Adjustment, Cleaning and Repair

A. The Contractor shall make final adjustments to level or contours.

B. Upon completion of the ceiling installation, the Contractor shall clean all strips and borders of dirt, dust, grease, oils, and fingerprints, etc. - using liquid detergent on a clean cloth.

C. All work that cannot be successfully cleaned and repaired shall be removed and replaced.

15.6.4 Inspection

Upon completion of the ceiling installation, the Engineer’s representative shall inspect all finished surfaces to ensure that the work has been completed in a manner satisfactory to the Engineer. Any deficiencies in the installed ceiling shall be corrected by the Contractor at no additional cost to the Client.

28. GYPSUM BOARD SYSTEMS

DESCRIPTION

Works described are for the installation of gypsum wall systems. All walls shall be covered with gypsum dry wall panels on both sides.

Store material off floor in dry area to prevent damage from moisture or excessive handling. Follow manufacturers' requirements for on-site storage and handling of materials.

MATERIALS

A. Furring Channels: USG metal stud channel, 38mm (1½"). Deep, roll-formed sections of 20-ga. Galvanized steel, ASTM C645.

B. Gypsum Wallboard [General and above 2.4m (8') AFF]: 16 mm (⅝") thick, ASTM C36, tapered edge, fire rated.

C. Gypsum Wallboard [Corridors, stairways, cafeteria, stage, and gymnasium up to at least 2.4m (8') AFF minimum]: Abuse resistant brand, 16mm (⅝") thick, ASTM C36, tapered edge, fire rated Type X. (Note: Provide at all "wet" areas (areas subject to contact with water), whether shown or not shown.

E. Exterior Gypsum Soffit Board: Standard or Fire Rated type, tapered edges, ends square cut, ASTM C931.

F. Gypsum Backing Board: Standard or Fire Rated type, square edges, ASTM C442.

G. Gypsum Sheathing: 12 mm (½") thick exterior water resistant board for metal framing systems with book tongue and grooved edges.

H. Compounds: Pre-fill powdered joint compound, laminating adhesive, taping compound and topping compound, ASTM C475.

I. Joint Tape: Perforated tape, ASTM C475.

J. Fasteners: Self-drilling, self-tapping bugle head screws, Type S12 and GA 216, length required for each assembly.

K. Metal Accessories:

1. Corner Beads: Dur-A-Bead No. 101, galvanized.

2. Metal Trim (Casing Bead): No. 200-A or 200-B metal trim, galvanized.

L. Interior Expansion Joint Covers: Balco Inc. or equal.

WORKMANSHIP

A. Examine adjacent construction for conditions that would prevent proper installation of drywall systems.

B. Do not proceed until defects are corrected.

METAL FRAMING INSTALLATION:

A. General:

1. Install metal framing in accordance with ASTM C754 except as otherwise specified.

2. Install members true to lines and levels to provide surface flatness with maximum variation of 3mm in 3m (⅛" in 10') in any direction.

3. Install metal studs at 400mm (16") o.c. unless noted otherwise.

B. Metal Furring Channels

1. Secure to walls and around door and window openings, intersections, and corners with low velocity power driven anchors.

2. Install metal furring at 400mm (16") o.c. vertically.

3. Extend furring on exterior walls full height of wall or as specified by engineer.

GYPSUM BOARD SYSTEM INSTALLATION:

A. Install in strict accordance with GA-201, GA-216 and GA-600, do not install until building is dried in.

B. Maximum variation in flatness 3mm in 3m (⅛" in 10').

C. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

D. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

E. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1.5 mm (1/16") of open space between panels. Do not force into place.

F. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

G. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

H. Attach gypsum panels to framing provided at openings and cut-outs.

I. Spot grout hollow metal doorframes for solid-core wood doors, hollow metal doors, and doors over 800 mm (32") wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

J. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in cases that are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 0.7 sm (8 sf) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 6.4- to 9.5-mm- (¼" - ⅜") wide joints to install sealant.

L. Isolate perimeter of non load-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 6.4- to 12.7-mm- (¼" - ½") wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

M. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

N. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

ACCESSORIES INSTALLATION:

A. Corner Beads: Install on external corners, with screws spaced 200mm (8") o.c. both sides.

B. Metal Trim: Install over face-layer gypsum board with fasteners spaced 200mm (8") o.c. Install where gypsum board surfaces meet dissimilar surfaces and at other detailed locations.

JOINT TREATMENT:

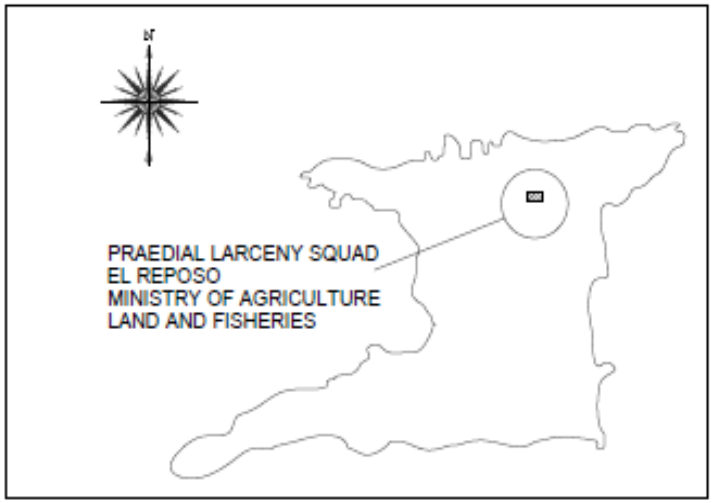
A. Treat joints, interior angles, fastener depressions and finishing trim on face-layer gypsum board, including gypsum board in ceiling plenums.

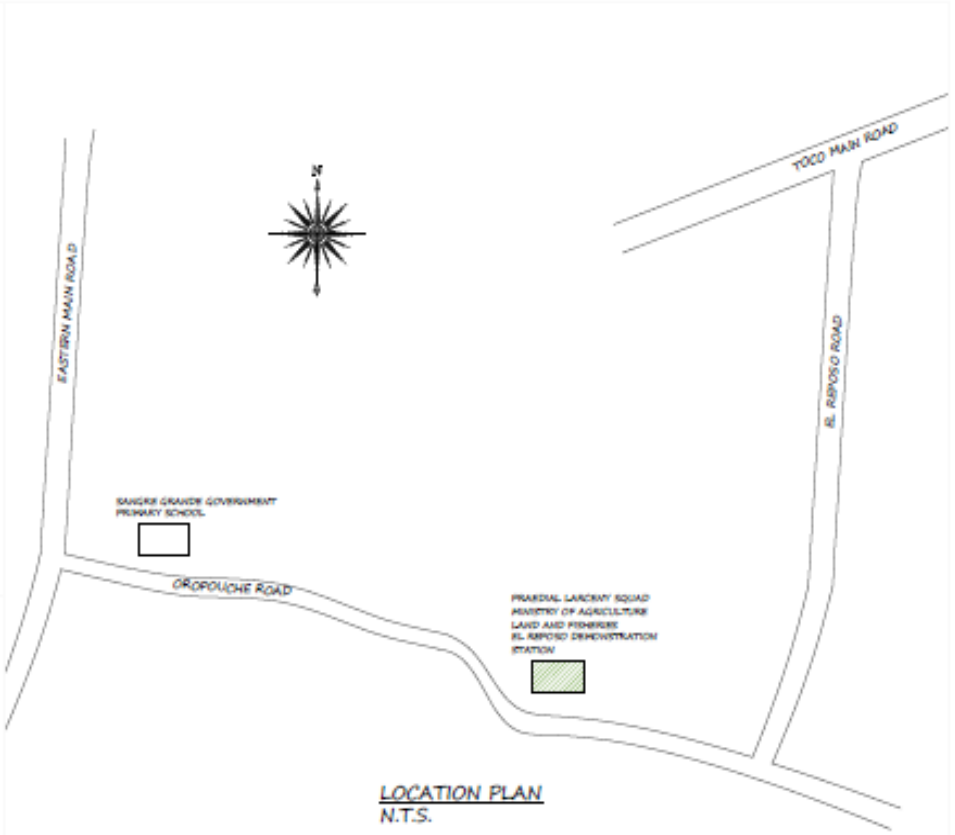
B. Pre-fill, tape, fill and finish in accordance with manufacturer's directions.

C. Apply a thin skim coat of joint compound over entire surface of gypsum board.

D. Sand finish coat and leave surfaces smooth, uniform, and free of fins, depressions, cracks and other imperfections.

DRAWINGS





LOCATION PLAN
N.T.S.

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
LOCATION PLAN

MINISTRY OF AGRICULTURE LAND AND FISHERIES ENGINEERING DIVISION

MAURICA ROAD, CENTENO
TEL: (662-0953/0957 FAX: (868) 2017

NO	REVISIONS	DATE	BY

PROJECT NO.
DATE: MAR 2023
SCALE: AS SHOWN
DRAWN BY: KL
DESIGNED BY:
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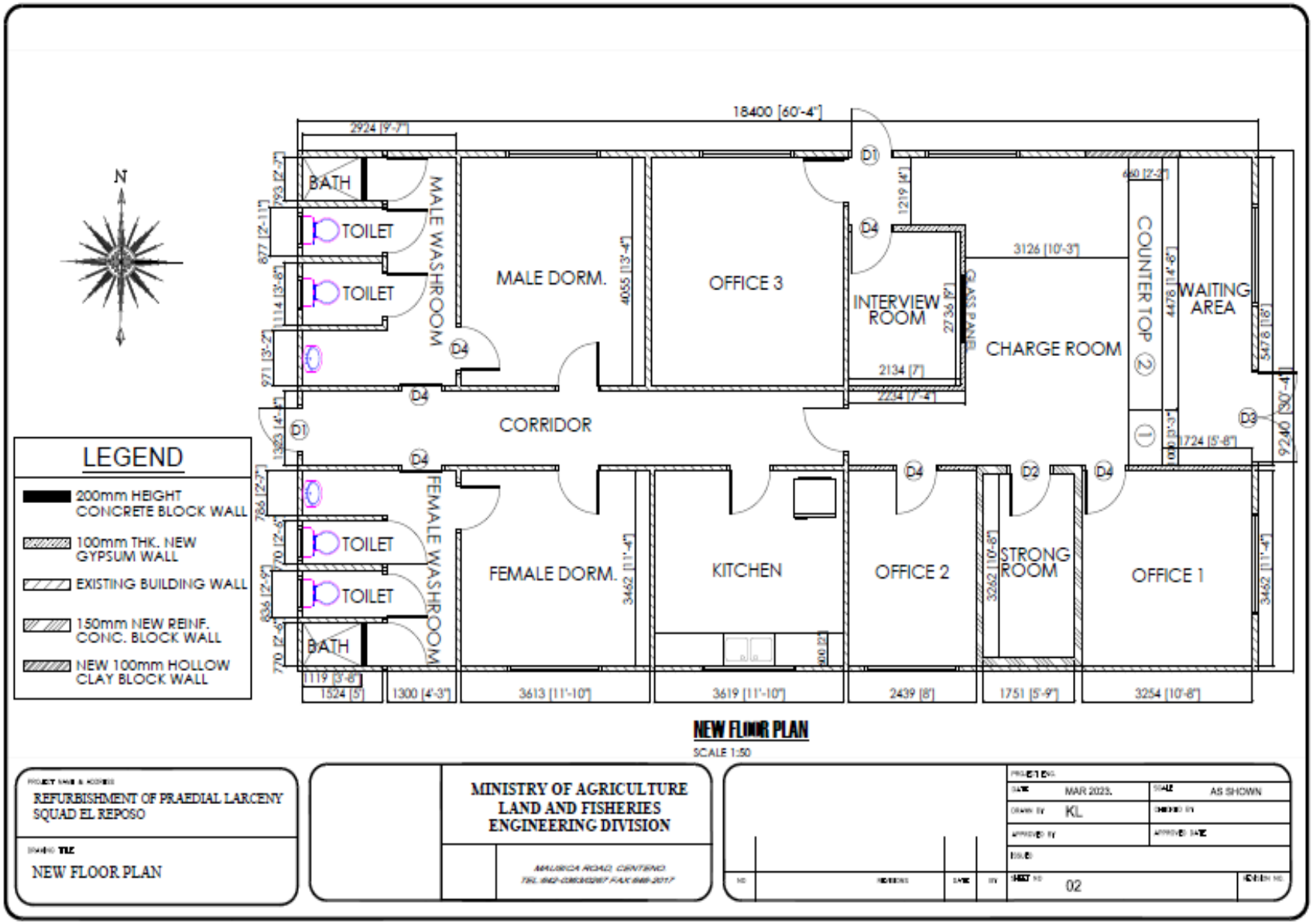
APPROVED DATE:
FILE:
SHEET NO: 01
REVISION NO.



NEW FLOOR PLAN

SCALE 1:50

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

NEW FLOOR PLAN

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAJORCA ROAD, CENTENO
TEL: (868) 636-2511 FAX: (868) 636-2017

DATE	MAR 2023.
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REVISION NO.	

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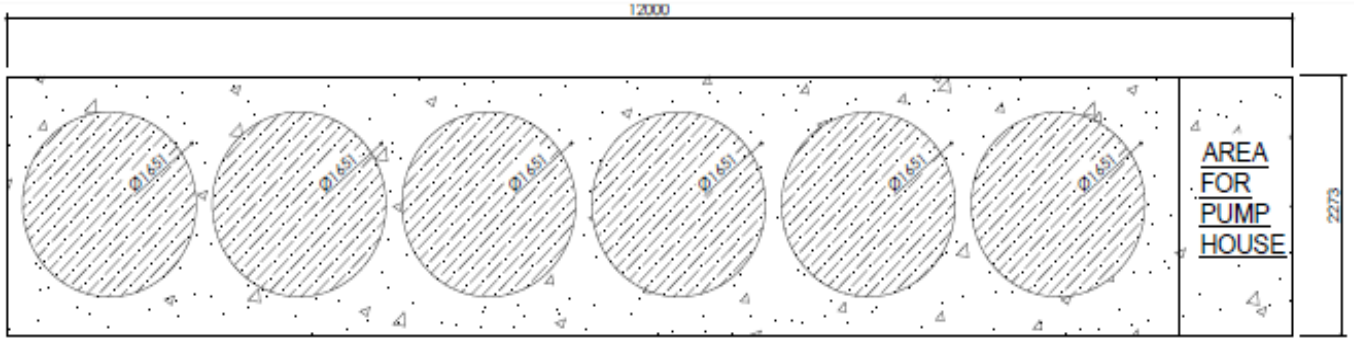

TANKSTAND -FLOOR PLAN

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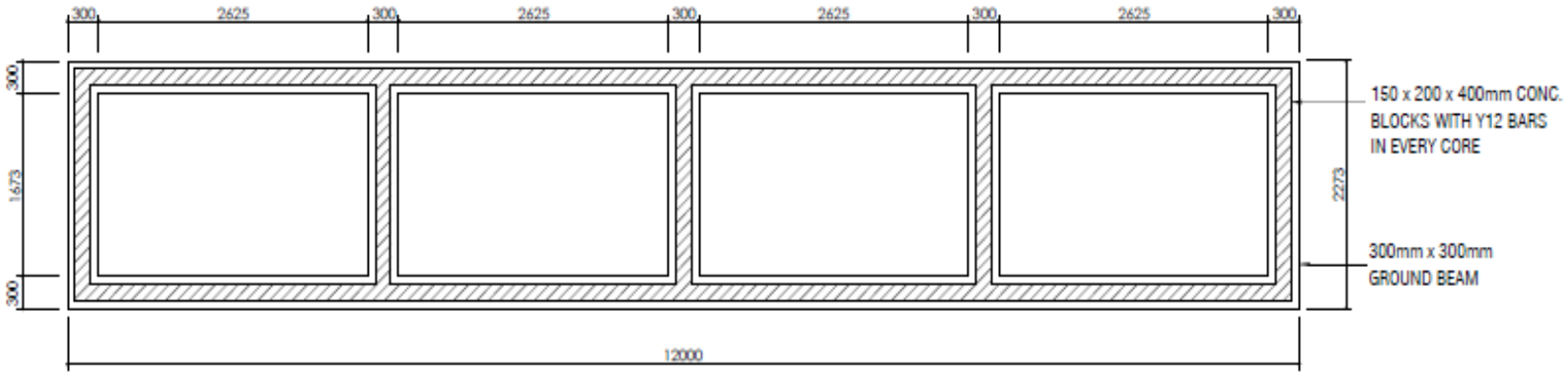

TANKSTAND - FOUNDATION PLAN

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REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

TANK STAND FLOOR AND FOUNDATION PLAN

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAJORCA ROAD, CENTEMO
TEL: (862)-CENTEMO/REF FAX: (868) 2017

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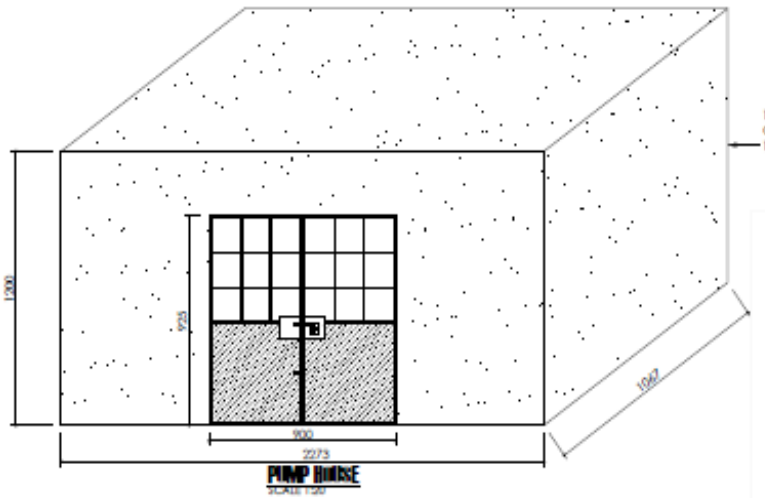
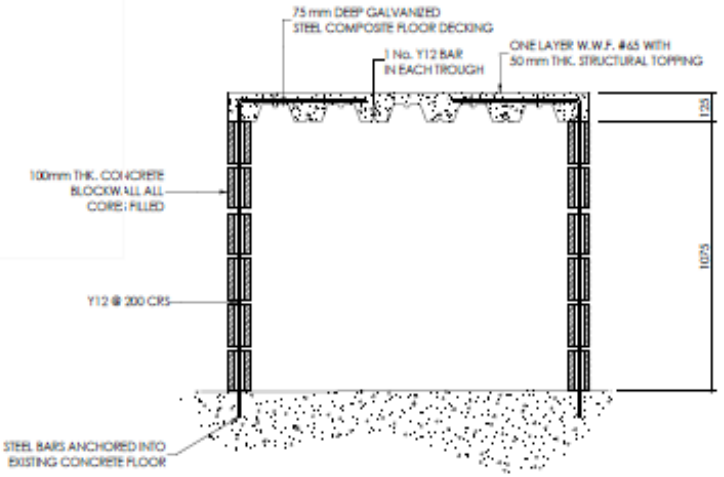


PUMP HOUSE



PUMP HOUSE SECTION

SCALE 1:20

PROJECT NAME & ADDRESS

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE

PUMP HOUSE AND SECTION

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAHOGANY ROAD, CENTENO
TEL: (868) 638-6331/6287 FAX: (868) 638-2017

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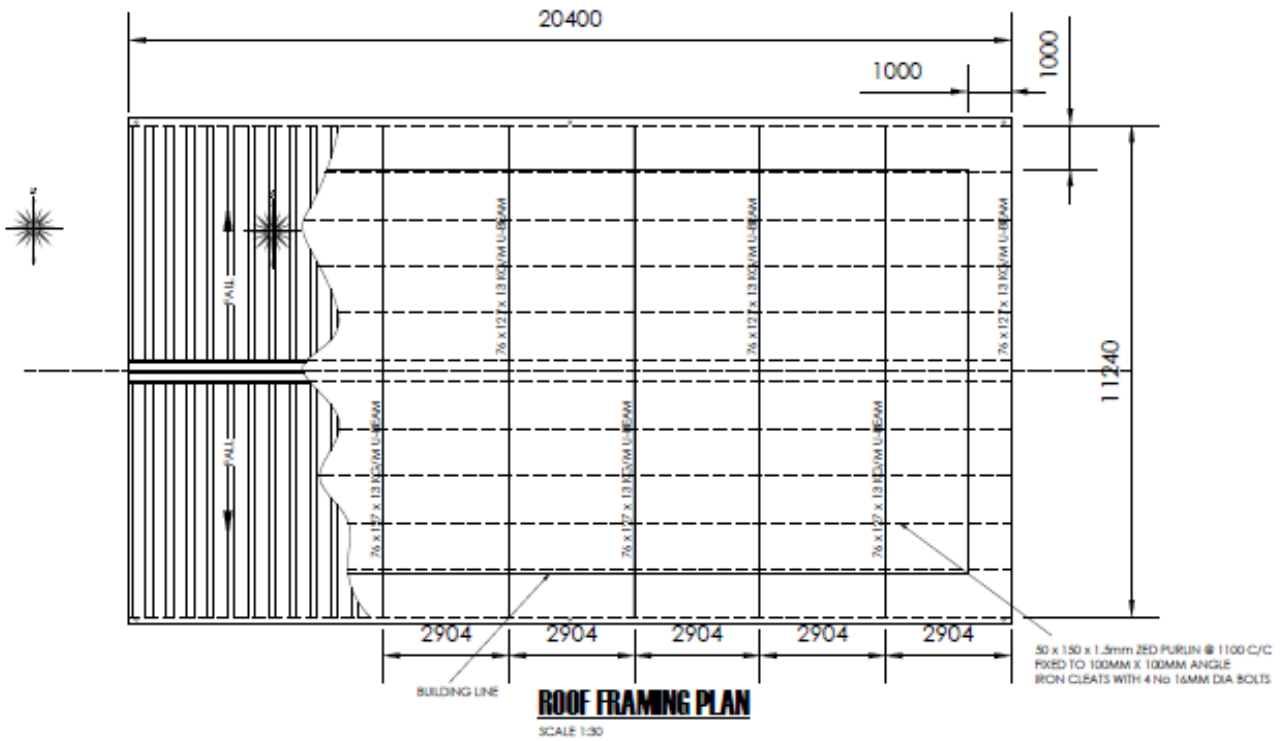
NO.	REVISIONS	DATE	BY
SHEET NO	04	REVISION NO.	



ROOF FRAMING PLAN

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PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
ROOF FRAMING PLAN

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAUSICA ROAD, CENTENO
TEL: (592)-(0)53(0)267 FAX:(592)-(0)48-2017

PROJECT NO.	
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SHEET NO	05
REVISION NO.	

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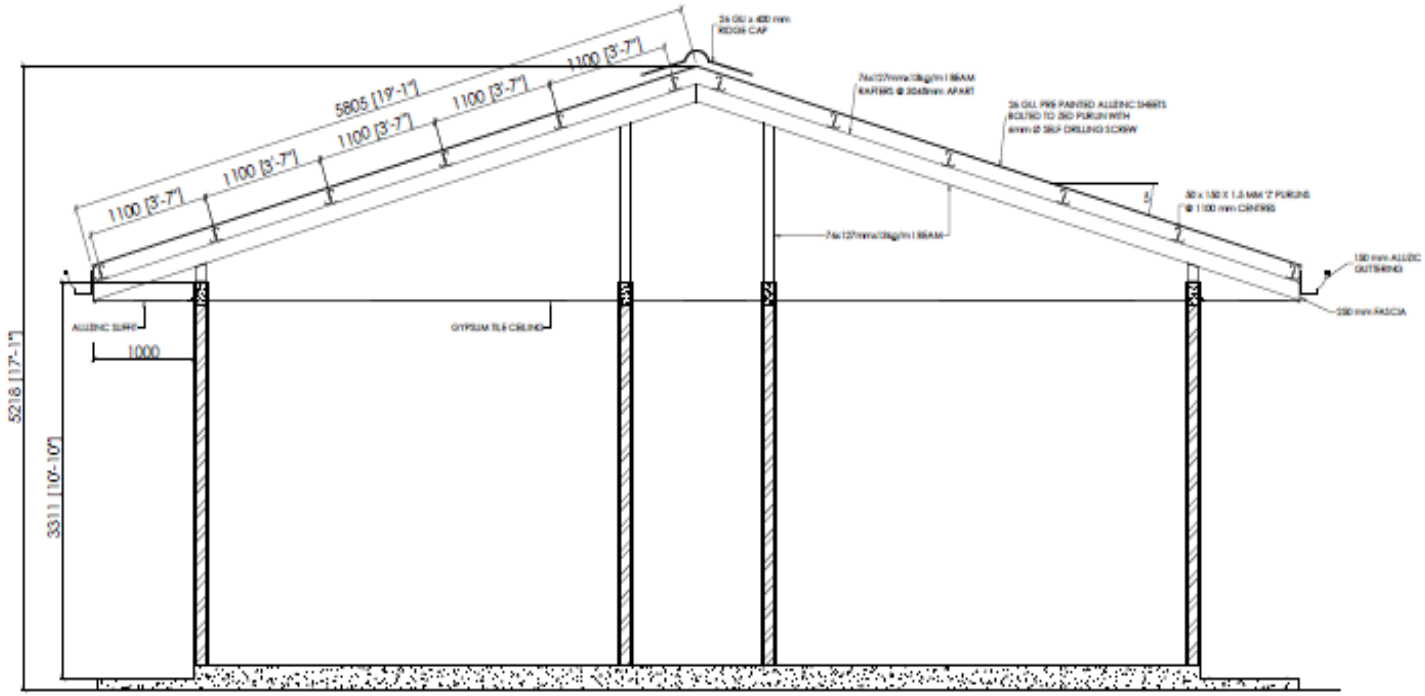

SECTION THRU
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PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
SECTION THRU

MINISTRY OF AGRICULTURE LAND AND FISHERIES ENGINEERING DIVISION

MAUSICA ROAD, CENTENO
TEL: (868)-638-6267 FAX:(868)-2017

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DATE	MAR 2023.	SCALE	AS SHOWN
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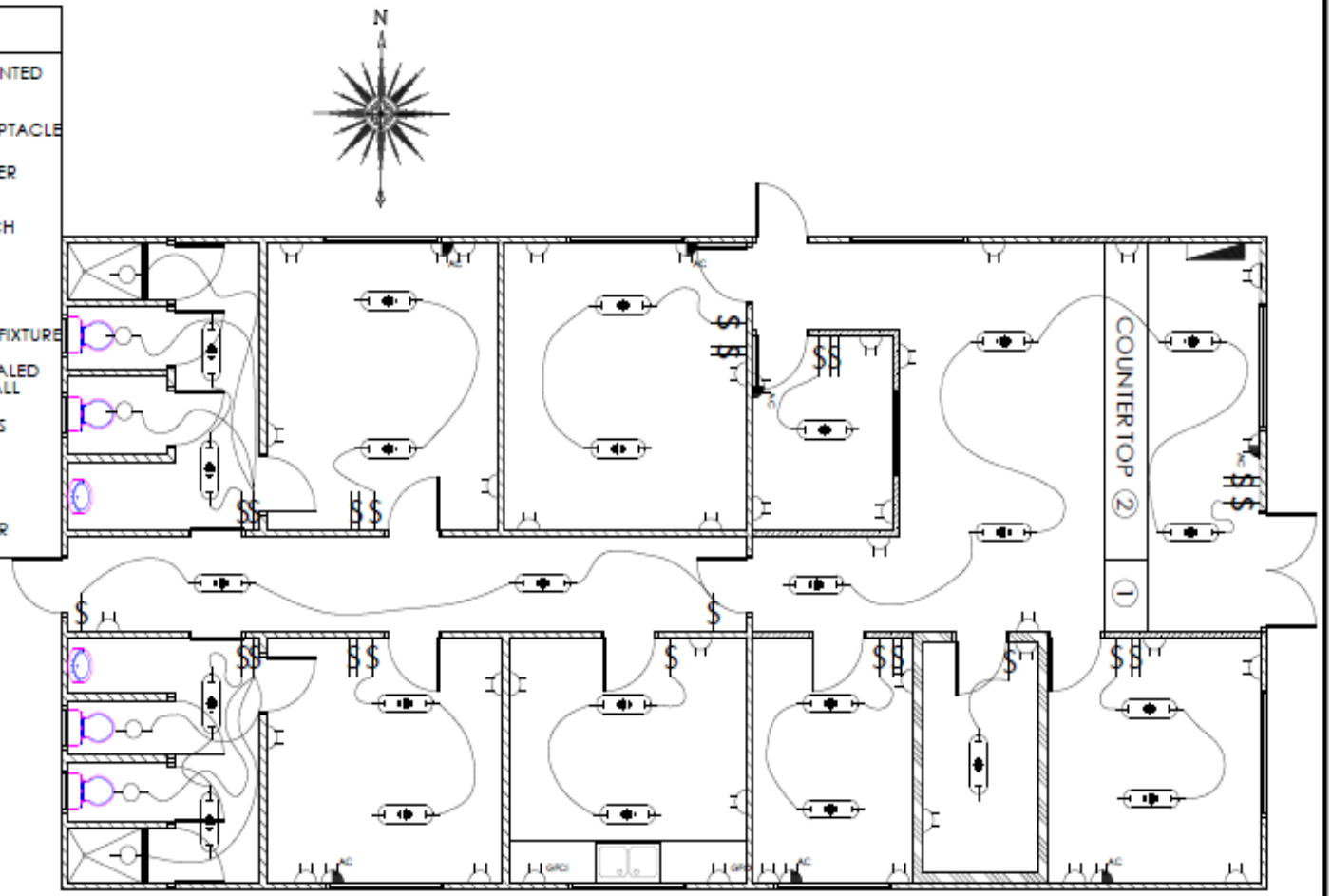
APPROVED BY		APPROVED DATE	
ISSUED			

SHEET NO. 06 REVISION NO.

LEGEND

- 2' x 4' CEILING MOUNTED LED LIGHT FIXTURE
- 220 V POWER RECEPTACLE
- 110 V DUPLEX POWER RECEPTACLE
- SINGLE POLE SWITCH
- AC SWITCH
- CEILING MOUNTED RECEPTACLE LIGHT FIXTURE
- CONDUIT - CONCEALED IN CEILING AND WALL
- PANEL BOX - RECESS
- METER BASE
- GROUND FAULT CIRCUIT INTERRUPTER



ELECTRICAL PLAN

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REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
ELECTRICAL PLAN

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MALSHICK ROAD, CENTENO
TEL: 642-0363/0267 FAX: 648-2017

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PROJECT NO.

DATE: MAR 2023	SCALE: AS SHOWN
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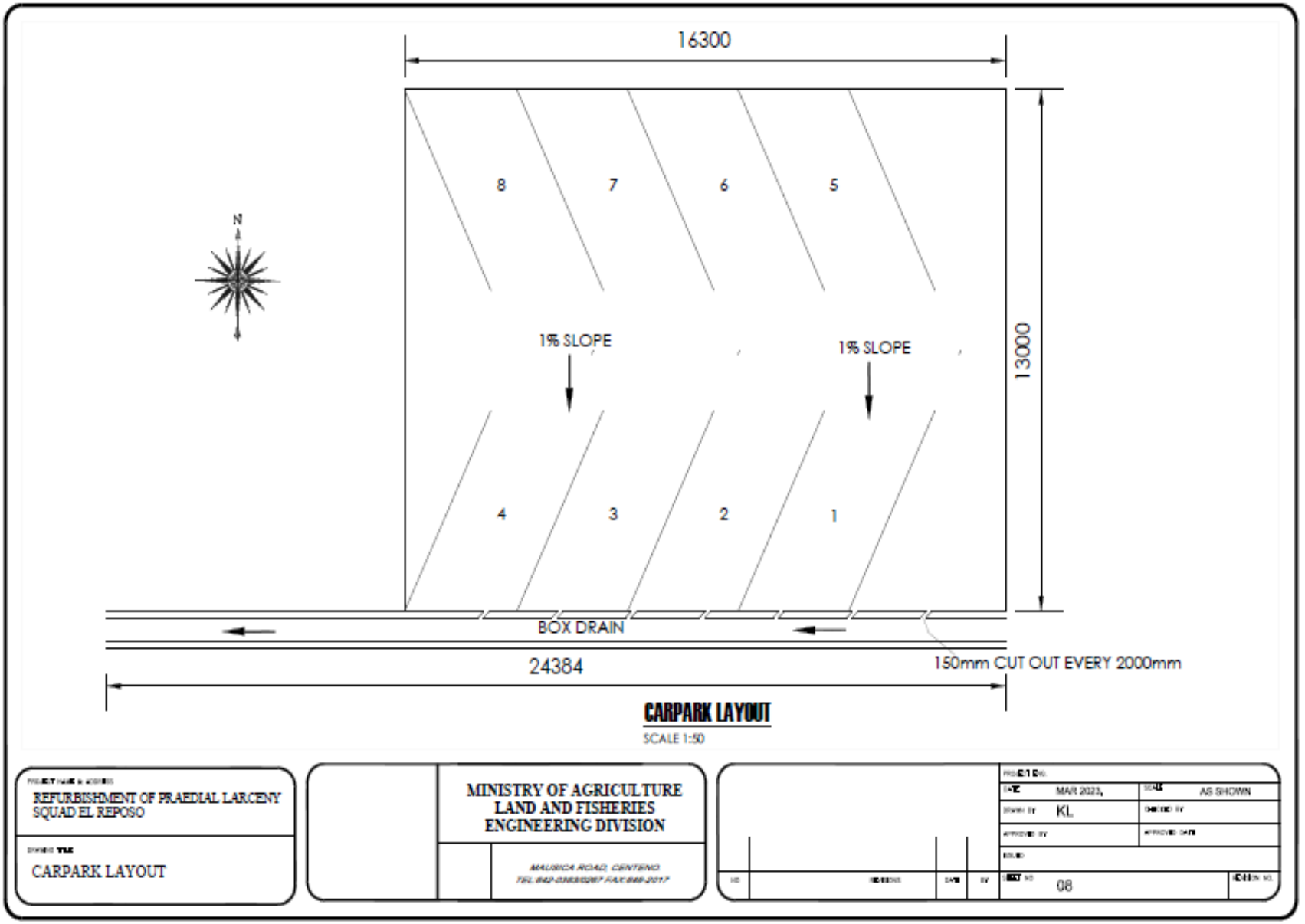


CARPARK LAYOUT

SCALE 1:50

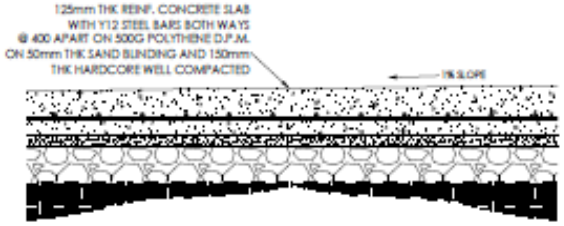
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

CARPARK LAYOUT

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAUBICA ROAD, CENTENO
TEL: 662-0368/0987 FAX: 668-2017

DATE: MAR 2023,
SCALE: AS SHOWN
Drawn By: KL
SHEET NO: 08



CROSS SECTION OF REINF. CONCRETE SLAB CARPARK

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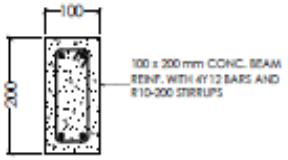
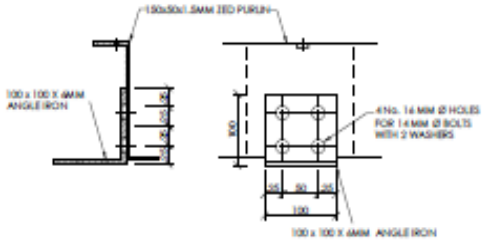


RING BEAM/ LINTEL DETAIL

SCALE 1:5



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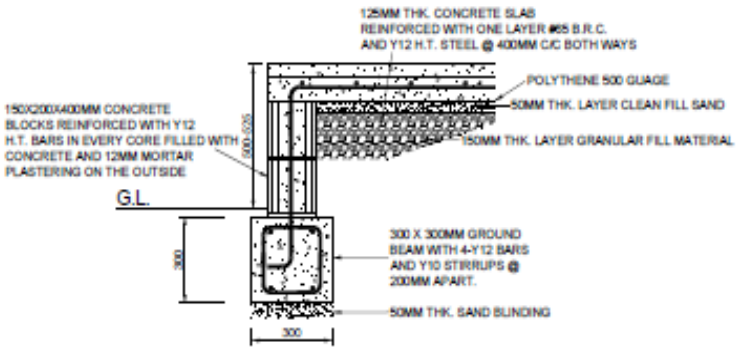
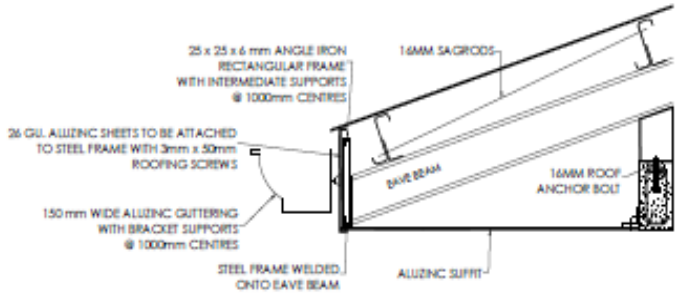


REINFORCEMENT DETAIL OF TANK STAND

SCALE 1:10



EAVE DETAIL

SCALE 1:10

PROJECT NAME & ADDRESS

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE

DETAILS

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAJORCA ROAD, CENTENO
TEL: (868) 638-6267, FAX: (868) 3017

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PROJECT NO.

DATE: MAR 2023.

SCALE: AS SHOWN

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APPROVED DATE:

ISSUED:

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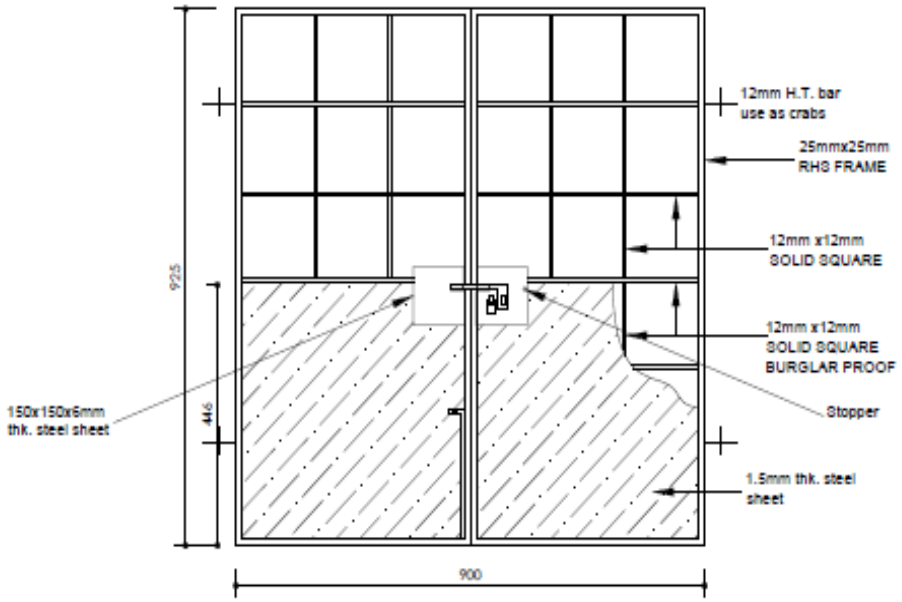
REVISION NO.



PUMP HOUSE GATE

SCALE 1:20

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
PUMP HOUSE GATE

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MALSICA ROAD, CENTENO
TEL: 642-0363/0367 FAX: 646-3017

PROJECT NO.	
DATE	MAR 2023
SCALE	AS SHOWN
DRAWN BY	KL
REVIEWED BY	
APPROVED BY	
APPROVED DATE	
ISSUED	
SHEET NO.	10
REVISION NO.	

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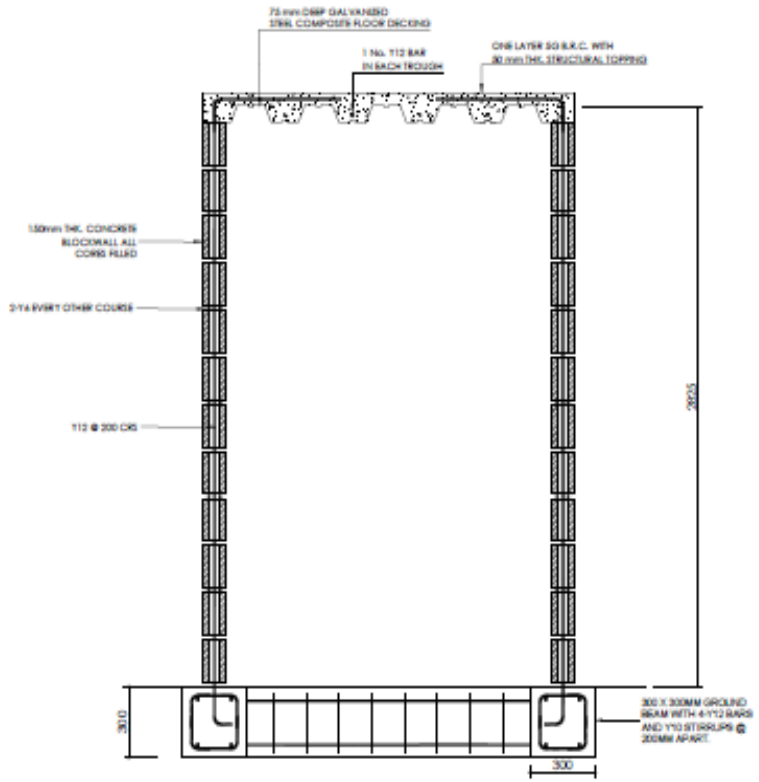


STRONG ROOM SECTION
SCALE 1:20

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

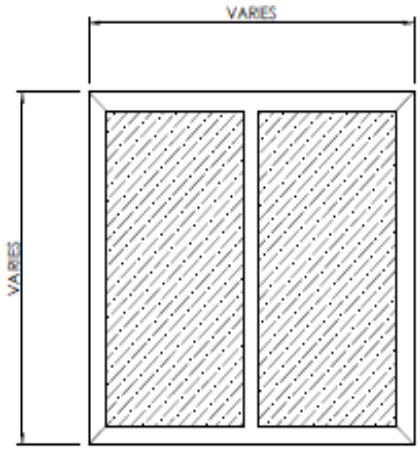
DRAWING TITLE
STRONG ROOM SECTION

MINISTRY OF AGRICULTURE LAND AND FISHERIES ENGINEERING DIVISION

MAURICIA RICHLO CENTENO
TEL: (868) 638-6287 FAX: (868) 638-2017

PRESENTATION

DATE: MAR 2023	SCALE: AS SHOWN
DRAWN BY: KL	REVIEWED BY:
APPROVED BY:	APPROVED DATE:
ISSUED:	
NO	REVISIONS	DATE	BY
SHEET NO: 11	REVISION NO:



PVC WINDOW
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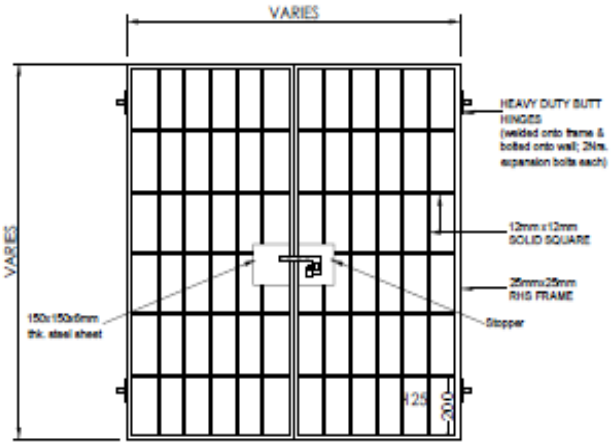

WINDOW BURGLAR PROOFING DETAIL
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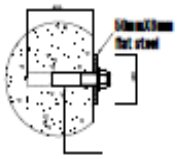
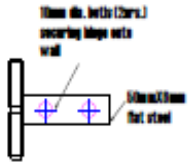


125mm LONG x 12mm ø EXPANSION BOLTS FIXED INTO WALL WITH 75mm. WASHER AND NUT HEADS TO BE TACK WELDED TO FLAT STEEL



FRAME TO CONC. FIXING DETAIL
SCALE 1 : 5

ALL DIMENSIONS IN MILLIMETERS

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
WINDOW AND BURGLAR PROOFING DETAILS

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MALGRAVE ROAD, CENTENO
TEL: 642-0365/0367 FAX: 648-2017

NO	REVISIONS	DATE	BY

PROJECT NO.
DATE: MAR 2023.
SCALE: AS SHOWN
DRAWN BY: KL
CHECKED BY:
APPROVED BY:
APPROVED DATE:
ISSUED:
SHEET NO: 12
REVISION NO.

LABELED DOOR SIZES AND TYPES

Single Doors

D1

Surface or concealed vertical rod exit device on each leaf (two active leaves) or rim exit device with hardware mullion (two active leaves).

Double and Single Egress Doors

Door Type	Maximum Size	Rating Available
DM 418	8080 (2438 x 2438)	3 Hr., 1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 420	8080 (2438 x 2438)	3 Hr., 1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 418	8080 (2438 x 2438)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 416	8080 (2438 x 2438)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE 418 (Insulated)	8080 (2438 x 2438)	3 Hr., 1 1/2 Hr., 3/4 Hr., 20 Min.
DE 420 (Insulated)	8080 (2438 x 2438)	3 Hr., 1 1/2 Hr., 3/4 Hr., 20 Min.

Doors with Fusible Link Louvers

Door Type	Maximum Size	Label Available
DM 420	3672 (914 x 2184)	1 1/2 Hr., 3/4 Hr.
DL 418	3672 (914 x 2184)	1 1/2 Hr., 3/4 Hr.
DE & DL 420	3672 (1067 x 2184)	1 1/2 Hr., 3/4 Hr.
DE & DL 418	3672 (1067 x 2184)	1 1/2 Hr., 3/4 Hr.
DE 416	3672 (1067 x 2184)	1 1/2 Hr., 3/4 Hr.

D2

* Maximum louver size: one 24" (610) x 24" (610) per door leaf. Not available with glass lites or fire exit hardware.

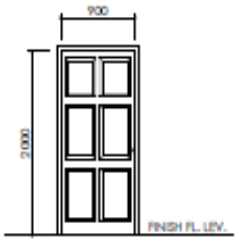
D3

Mortise or cylindrical lock with open or closed back strike and flush bolts

Door Type	Maximum Size	Rating Available
DM 420	8070 (2438 x 2134)	1 1/2 Hr., 3/4 Hr., 20 Min.
DM 418	8070 (2438 x 2134)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 418	80100 (2438 x 3048)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 416	80100 (2438 x 3048)	1 1/2 Hr., 3/4 Hr., 20 Min.
DS 418	80100 (2438 x 3048)	1 1/2 Hr., 3/4 Hr., 20 Min.
DS 416	80100 (2438 x 3048)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE 420 (Temp. Rise)	8072 (1829 x 2184)	1 1/2 Hr., 3/4 Hr.
DE 418 (Temp. Rise)	8072 (2438 x 2184)	1 1/2 Hr., 3/4 Hr.
DE & DL 418 (Insulated)	8080 (2438 x 2438)	1 1/2 Hr., 3/4 Hr., 20 Min.
DE & DL 416 (Insulated)	8080 (2438 x 2438)	1 1/2 Hr., 3/4 Hr., 20 Min.
UNIFIT™	8080 (2438 x 2438)	1 1/2 Hr., 3/4 Hr., 20 Min.
D2 , D3 & D4	80100 (2438 x 3048)	1 1/2 Hr., 3/4 Hr., 20 Min.

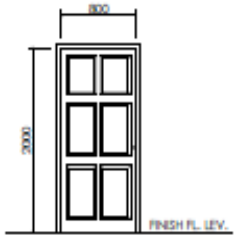
Double Doors with French Vision Panel

D4



CEDAWOOD PANEL DOOR

D5



PITCH PIPE PANEL DOOR

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

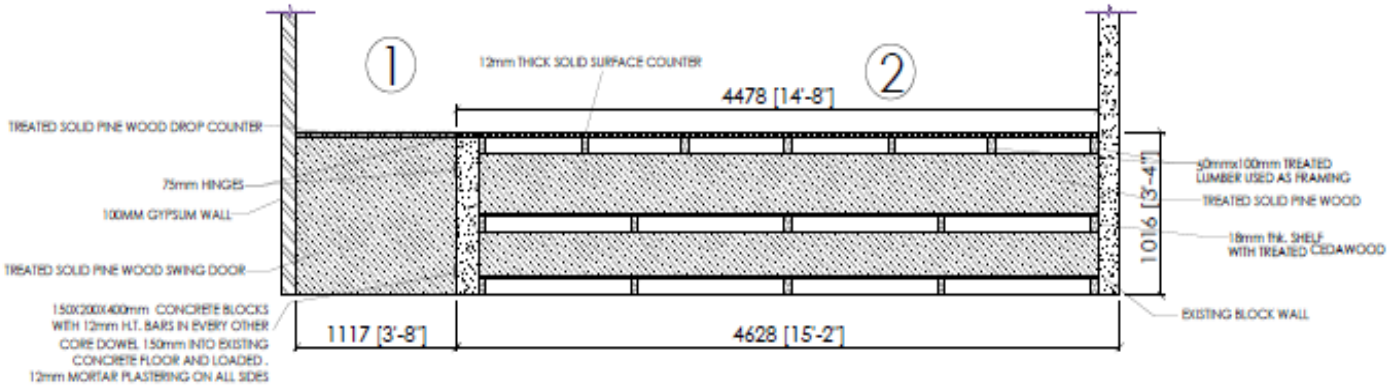
DRAWING TITLE
DOOR SCHEDULE

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAUDICA ROAD, CENTENO
TEL (662-0860/0867 FAX (868-2017

NO	REVISIONS	DATE	BY

PROJECT NO.
DATE MAR 2020
SCALE AS SHOWN
DRAWN BY KL
CHECKED BY
APPROVED BY
APPROVED DATE
ISSUED
SHEET NO 13
REVISION NO



COUNTER ELEVATION 1 AND 2

SCALE 1:20

PROJECT NAME & ADDRESS

REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE

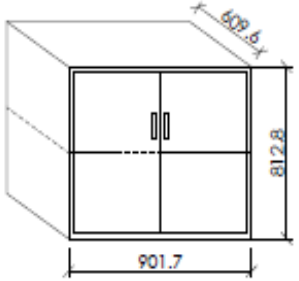
COUNTER ELEVATION

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAURICA ROAD, CENTENO
TEL: 662-CROSS/267 FAX: 668-2017

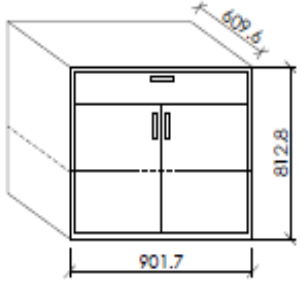
PROJECT NO.			
DATE	MAR 2023.	SCALE	AS SHOWN
DRAWN BY	KL	CHECKED BY	
APPROVED BY		APPROVED DATE	
ISSUED			
NO	REVISIONS	DATE	BY
SHEET NO	14	REVISION NO.	

PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DIMENSIONS : 812.8mm H x 901.7mm Wx 609.6mm D



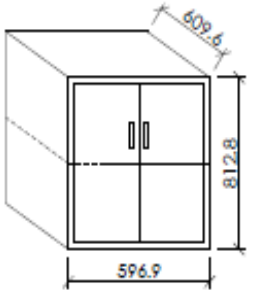
BASE WALL CABINET 1
SCALE 1:30

PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DIMENSIONS : 812.8mm H x 901.7mm Wx 609.6mm D



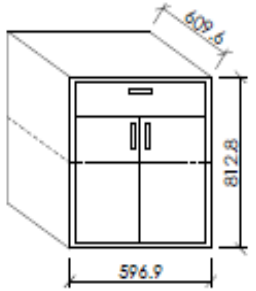
BASE WALL CABINET 2
SCALE 1:30

PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DIMENSIONS : 812.8mm H x 596.9mm Wx 609.6mm D



BASE WALL CABINET 3
SCALE 1:30

PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DRAWER SLIDES : SOFT CLOSE, FULL EXTENSION SLIDES WITH 35KG LOAD CAPACITY
DIMENSIONS : 812.8mm H x 596.9mm Wx 609.6mm D



BASE WALL CABINET 4
SCALE 1:30

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
BASE WALL CABINETS

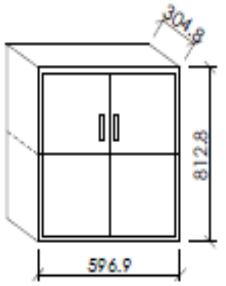
MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAUSICA ROAD, CENTEENO
TEL: 668-0360/0367 FAX: 668-2017

NO	REVISIONS	DATE	BY

PROJECT NO.
DATE: MAR 2023
SCALE: AS SHOWN
DRAWN BY: KL
CHECKED BY:
APPROVED BY:
APPROVED DATE:
ISSUED:
SHEET NO: 15
REVISION NO.

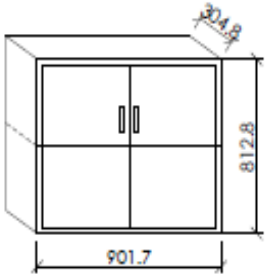
PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DIMENSIONS : 812.8mm H x 596.9mm Wx 304.8mm D



WALL HUNG CABINET 1

SCALE 1:30

PVC FLOOD WOOD BOX
FULLY WATERPROOF AND TERMITE RESISTANT
SELECTED TIMBER FRONT AND FRAME
SOFT CLOSE, FULLY CONCEALED HINGED WITH 105 DEGREE OPENING
DIMENSIONS : 812.8mm H x 901.7mm Wx 304.8mm D



WALL HUNG CABINET 2

SCALE 1:30

PROJECT NAME & ADDRESS
REFURBISHMENT OF PRAEDIAL LARCENY SQUAD EL REPOSO

DRAWING TITLE
WALL HUNG CABINETS

MINISTRY OF AGRICULTURE
LAND AND FISHERIES
ENGINEERING DIVISION

MAUSICA ROAD, CENTEMO
TEL (868) 638-6287 FAX (868) 2017

NO	REVISIONS	DATE	BY

PROJECT NO.
DATE MAR 2023.
SCALE AS SHOWN
DRAWN BY KL
CHECKED BY
APPROVED BY
APPROVED DATE
ISSUED
SHEET NO 16
REVISION NO