Procurement Policy Office
(Established under section 4 of the Public Procurement Act 2006)

Ref: OAB/NA/Q7/15-16

STANDARD BIDDING DOCUMENTS

for

Refurbishment of Lunch Room and Kitchen at New Government centre-The National Assembly

National Assembly
Port Louis
FEB 2016
Invitation for Bids (IFB)

Authorised under Section (14)2 of the Public Procurement Act

1. The National Assembly invites sealed bids from eligible and qualified bidders for Refurbishment of Lunch room and kitchen at New Government Centre, as more fully described in the bid documents. Bidding shall be conducted through Advertised Bidding Procedures according to the Public Procurement Act 2006.

The refurbishment period is **45 days** from date of commencement of work.

2. Interested eligible bidders may obtain further information from the Procurement & Supply officer, National Assembly, Level 3, New Government House, Port Louis and inspect the Bidding Documents at the address given in paragraph 7 from **0900 to 1500 hrs**.

3. Qualifications requirements include:
   - Contractors having the technical capacity, resources and sound financial situations, and
   - As per other qualifying criteria mentioned in the bid documents.

4. A complete set of Bidding Documents in English may be purchased by interested bidders on calling at the address in paragraph 6 and upon payment of a non-refundable fee **Rs. 2,000.00**. The method of payment will be **either by cash or by crossed bank cheque to the order of the Government of Mauritius**.

5. Bids must be delivered to the address in paragraph 7 at or before **14.00 hours on Tuesday 15 March 2016**. Electronic bidding **shall not** be permitted. Late bids will be rejected. Bids will be opened physically in the presence of the bidders’ representatives who choose to attend in person at the stated address at **14.15 on Tuesday 15 March 2016**.

6. A **pre-bid meeting** has been scheduled for **Friday 19 February 2016 at 10.30 hours**.

7. The addresses referred to above are:

   For consulting and purchasing bid document:
   
   **Procurement and supply officer**  
   **National Assembly**,  
   **Level 3, New Government House**,  
   **Port Louis**

   For submission of bids and to attend to bid opening:

   **The Clerk of the National Assembly**,  
   **Level 3, New Government House**,  
   **Port Louis**
Summary Description

This Standard Bidding Document for Procurement of Works is to be used when a prequalification process has not taken place before bidding and, therefore, post-qualification applies. A brief description of these documents is given below.

SBD for Procurement of Works

PART 1 – BIDDING PROCEDURES

Section I. Instructions to Bidders (ITB)

This Section provides relevant information to help Bidders prepare their bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of Contracts. **Section I contains provisions that are to be used without modification.**

Section II. Bidding Data Sheet

This Section consists of provisions that are specific to each procurement and that supplement the information or requirements included in Section I, Instructions to Bidders.

Section III. Bidding Forms

This Section contains the forms which are to be completed by the Bidder and submitted as part of his Bid.

Section IV. Evaluation Criteria

This section contains supplementary evaluation criteria which the Employer may choose to apply to the procurement under consideration.

PART 2 – EMPLOYER’S REQUIREMENTS

Section V. Employer’s Requirements

This Section contains the Specification, the Drawings, and supplementary information that describe the Plant and Installation Services to be procured.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VI. General Conditions of Contract

This Section contains the general clauses to be applied in all contracts. **The text of the clauses in this Section shall not be modified.**
Section VII. Particular Conditions of Contract

The contents of this Section supplement the General Conditions of Contract and shall be prepared by the Employer.

Section VIII. Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.
Issued on: ________________

for

Refurbishment of Lunch Room and Kitchen at New Government centre-The National Assembly

Procurement Reference No: OAB/NA/Q7/15-16

NATIONAL ASSEMBLY
LEVEL 3, NEW GOVERNMENT HOUSE
PORT LOUIS
TEL: 2011572
FAX: 2011238
EMAIL: dagopaul@govmu.org
# Standard Bidding Document

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PART 1 – Bidding Procedures
# Section 1 - Instructions to Bidders

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Section I - Instructions to Bidders

A. General

1. Scope of Bid

1.1 The Public Body as defined in Section II “Bidding Data Sheet” (BDS) also referred to herein as Employer invites bids for the construction of Works, as described in the BDS and Section VII, “Particular Conditions of Contract” (PCC).

The name and identification number of the Contract are provided in the BDS and the PCC.

1.2 The successful Bidder shall be expected to complete the Works by the Intended Completion Period specified in the BDS.

1.3 Throughout these bidding documents, the terms:

(a) “writing” means any typewritten or printed communication, including e-mail and facsimile transmission,

(b) “day” means calendar day, and

(c) Singular also means plural.

2. Source of Fund

2.1 The Works shall be financed by the Public Body’s own budgetary allocation, unless otherwise stated in the BDS.

3. Challenge and Appeal

3.1 Unsatisfied bidders shall follow procedures prescribed in Regulations 48, 49 and 50 of the Public Procurement Regulations 2008 to challenge procurement proceedings and award of procurement contracts or to file application for review at the Independent Review Panel.

3.2 Addresses to forward Challenges or Application for Review are specified in the BDS.

4. Fraud and Corruption

4.1 The Government of the Republic of Mauritius requires that bidders/suppliers/contractors, participating in procurement in Mauritius, observe the highest standard of ethics during the procurement process and execution of contracts.

4.2 Bidders, suppliers and public officials shall be aware of the provisions stated in sections 51 and 52 of the Public Procurement Act which can be consulted on the website of the Procurement Policy Office (PPO): ppo.govmu.org

4.3 The Employer will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;

For the purposes of this Sub-Clause:

(i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

(ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

(iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(v) “obstructive practice” is deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation

4.4 The Employer commits itself to take all measures necessary to prevent fraud and corruption and ensures that none of its staff, personally or through his/her close relatives or through a third party, will in connection with the bid for, or the execution of a contract, demand, take a promise for or accept, for him/herself or third person, any material or immaterial benefit which he/she is not legally entitled to. If the Employer obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of Mauritius or if there be a substantive suspicion in this regard, he will inform the relevant authority (ies) and in addition can initiate disciplinary actions. Furthermore, such bid shall be rejected.
5. **Eligible Bidders**

5.1 (a) In accordance with CIDB (Registration of Consultant and Contractors) Regulation 2014, Contractors currently operating in the construction industry have the statutory obligation to be registered with the Construction Industry Development Board (CIDB) accordingly.

(b) Subject to paragraph (c) below, a transition period as from 01 August 2014 is provided for all contractors to register with the CIDB.

(c) Foreign contractors as defined in the CIDB Act will have to apply for and obtain a Provisional Registration prior to bidding for this project. If the contract is awarded to the foreign contractor the latter shall have to apply for and obtain a Temporary Registration before starting the project.

(d) Contractors whether local or foreign under an existing or intended joint venture will be eligible as a joint venture if, in addition to their respective individual registration, they obtain a Provisional Registration for the joint venture prior to bidding for this project. If an existing or intended joint venture is awarded the contract it shall have to apply for a Temporary Registration prior to starting the project.

(e) Sub-contractors undertaking works for value Rs 500 000 or above are subject to registration as applicable to Contractors.

(f) Notwithstanding paragraphs (a) and (c) above, a firm or person that was undertaking construction works, in Mauritius immediately before 1 August 2014 may continue to undertake construction works for such period as may be prescribed, without being registered as a contractor or foreign contractor, as the case may be. They may thus participate in public procurement and be awarded a public contract during that period.

(g) Bidders may consult the website of the CIDB cidb.govmu.org for further details concerning registration of contractors.

5.2 (a) Bidder may be natural person, private entity, or government-owned entity or any combination of them in the form of a joint venture.

(b) Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the BDS:

(i) the Bid shall include all the information listed in ITB Sub-Clause 6.2 below for each joint venture partner;
(ii) the Bid shall be signed so as to be legally binding on all partners;

(iii) the Bid shall include a copy of the agreement entered into by the joint venture partners defining the division of assignments to each partner and establishing that all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms; alternatively, a Letter of Intent to execute a joint venture agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement;

(iv) one of the partners shall be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and

(v) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

5.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

(a) they have a controlling partner in common; or

(b) they receive or have received any direct or indirect subsidy from any of them; or

(c) they have the same legal representative for purposes of this bid; or

(d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

(e) a Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which the party is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid; or

(f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical
specifications of the contract that is the subject of the Bid; or

(g) a Bidder, or any of its affiliates has been hired (or is proposed to be hired) by the Employer as Engineer for the contract.

5.4 (a) A bidder that is under a declaration of ineligibility by the Government of Mauritius in accordance with applicable laws at the date of the deadline for bid submission and thereafter shall be disqualified.


Links for checking the ineligibility lists are available on the PPO’s website: ppo.govmu.org

5.5 Government-owned enterprises in the Republic of Mauritius shall be eligible only if they can establish that they are legally and financially autonomous and operate under commercial law, and that they are not a dependent agency of the Government.

6. Qualifications of Bidders

6.1 All bidders shall provide in Section III, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.

6.2 Bidders shall include the information and documents listed hereunder with their bids, unless otherwise stated in the BDS subject to ITB sub-clause 6.3. If, after opening of bids, it is found that any document is missing, the Employer may request the submission of that document subject to clause 30. The non-submission of the documents by the Bidder within the prescribed period may lead to the rejection of its bid.

(a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business of the Bidder;

(b) total monetary value of construction works performed for each of the last five years;

(c) experience in works of a similar nature and size for each of the last five years or as otherwise stated in the BDS; and clients who may be contacted for further information on those contracts;

(d) major items of construction equipment proposed to carry out the Contract;

(e) qualifications and experience of key site personnel and
technical personnel proposed for the contract;

(f) report on the financial standing of the Bidder for the last three years, such as certified copies of Financial Statements/Audited Accounts as filed at the Registrar of Companies before the deadline set for submission of bids;

(g) evidence of adequacy of cash-flow capital for this Contract (access to line(s) of credit and availability of other financial resources);

(h) authority to seek references from the Bidder’s bankers;

(i) information regarding any litigation, current or during the last five years, in which the Bidder was/is involved, the parties concerned, the issues involved, the disputed amounts, and awards; and

(j) proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price
6.3 The ITB sub-clauses 6.2 (b), (c), and (f) shall not apply for bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the grade that covers adequately the size and type of works related to the project.

6.4 To qualify for award of the Contract, bidders shall meet the following minimum qualifying criteria subject to ITB sub-clause 6.5:

a) a minimum average annual financial amount of construction work over the period or registered with the CIDB under the grade specified in the BDS.

(b) experience as prime contractor in the construction of a minimum number of works of a nature and complexity equivalent to the Works over a period (To comply with this requirement, works cited should be at least 70 percent complete) or registered with the CIDB under field of specialisation specified in the BDS;

(c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed in the BDS;

(d) a Contract Manager/Supervisor with five years’ experience in works of an equivalent nature and volume, including no less than three years as Manager or as otherwise specified in the BDS; and

(e) liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than the amount specified in the BDS.2

A consistent history of litigation or arbitration awards against the Applicant or any partner of a Joint Venture may result in Disqualification.

6.5 ITB sub-clause 6.4 (a) shall not apply to bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the grade that covers adequately the size and type of works related to the project.

ITB sub-clause 6.4 (b) shall not apply where the category of field of specialization as defined by CIDB referred to in the BDS covers adequately the field of specialization in respect of the complexity and key specialization defined by the public body.

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2 Usually the equivalent of the estimated payments flow over 4-6 months at the average (straight line distribution) construction rate. The actual period of reference shall depend on the speed with which the Government shall pay the Contractor’s monthly certificates.
B. Contents of Bidding Document

7. Sections of Bidding Document

7.1 The Bidding Document consists of all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 10.

- Section I - Instructions to Bidders (ITB)
- Section II - Bidding Data Sheet
- Section III - Bidding Forms
- Section IV - Evaluation Criteria
- Section V - Employer’s Requirements
- Section VI – General Conditions of Contract
- Section VII- Particular Conditions of Contract
- Section VIII - Contract Forms

7.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.

8. Clarification of Bidding Document

8.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer’s address indicated in the BDS. The Employer will respond in writing to any request for clarification, provided that such request is received 15 days prior to the deadline for submission of bids.

Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 10.

9. Site visit/Pre-bid meeting

9.1 Bidders, at the Bidders’ own responsibility and risk, are encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing their Bids and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidders’ own expense.

9.2 The Bidder or its designated representative is invited to attend a pre-bid meeting, as provided for in the BDS. The purpose of the pre-bid meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

10. Amendment of Bidding

At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda and extend the deadline for submission of bids, if
**C. Preparation of Bids**

11. **Cost of Bidding**  
11.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs irrespective of the outcome of the bidding process.

12. **Language of Bid**  
12.1 The Bid, supporting documents as well as all correspondence relating to the bid exchanged by the Bidder and the Employer shall be in English Language.

13. **Documents Comprising the Bid**  
13.1 The Bid shall comprise the following:

(a) Bid submission Form (in the format indicated in Section III);

(b) Qualification information and documentary evidence establishing the Bidder’s qualifications to perform the contract;

(c) completed Bill of Quantities / Activity Schedule;

(d) Bid Security as per the format provided in section III or as a subscription to a Bid Securing Declaration in the Bid Submission Form;

and any other material required to be completed and submitted by bidders, as specified in ITB and the BDS.

14. **Bid Submission Form and Schedules**  
14.1 The Bid Submission Form, Schedules, and all documents listed under ITB 13.1 shall be prepared using the relevant forms, if so provided.

15. **Alternative Proposal**  
15.1 Alternative Technical Proposals and completion dates if allowed shall be indicated in Section V- Specifications. The evaluation methodologies for their consideration shall be given in Section IV.

16. **Bid Prices and Discounts**  
16.1 The Contract shall be for the whole Works, as described in ITB Sub-Clause 1.1, based on the priced Activity Schedule/Bill of Quantities submitted by the Bidder.

16.2 Bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by Bidders, shall not be paid for by the Public Body when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. Corrections, if any, shall be made by crossing out, initialing,
dating and rewriting.

16.3 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 14 days prior to the deadline for submission of bids, shall be included in the rates, prices, and total Bid price submitted by Bidders.5

16.4 The price to be quoted in the Bid Submission Form shall be the total price of bid after any discount offered.

The discount if any and the conditions of its application shall be indicated separately.

17. Currencies of Bid and Payment

17.1 The bid price and rates shall be in Mauritian Rupees and fixed for the duration of the contract unless otherwise specified in the BDS.

17.2 Unless otherwise specified in BDS interim payment for Plant and Material on site is applicable as per GCC 39.7.

18. Documents Comprising the Technical Proposal

18.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in the Bidder Qualification Form (section III), in sufficient details to demonstrate the adequacy of the Bidders’ proposal to meet the work requirements and the completion time.

19. Period of Validity of Bids

19.1 Bids shall remain valid for a period of 90 days after the bid submission deadline prescribed by the Employer unless otherwise specified in the BDS.

19.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing.

20. Bid Security/Bid Securing Declaration

20.1 The Bidder shall furnish either a subscription to a Bid Securing Declaration or a Bid Security in its original form with its bid as part of its bid, if so required in the BDS.

20.2 Bid Security shall be in the form of a Bank Guarantee from a local commercial bank as per the format contained in section III and shall be valid for a period of 30 days beyond the validity period of the bid or beyond any period of extension.

20.3 Any bid not accompanied by an enforceable and substantially compliant Bid Security or a subscription to a Bid Securing Declaration in the Bid Submission Form, if required in accordance with ITB 20.1, shall be rejected by the Employer.
as non-responsive.

20.4 Bid Security shall be forfeited or the Bid Securing declaration exercised for non-compliance on the part of the Bidder for reasons mentioned in the Bid Security format contained in Section III or the Bid Suring Declaration contained as Appendix to the Bid Submission Form.

21. **Format and Signing of Bid**  

21.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 13.1 and clearly mark it “ORIGINAL”. In addition, the Bidder shall submit two copies of the bid and clearly mark each of them “COPY.” In the event of any discrepancy between the original and the copies, the original shall prevail.

21.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder.

**D. Submission and Opening of Bids**

22. **Sealing and Marking of Bids**  

22.1 Bidders may always submit their bids by mail or by hand. Procedures for submission, sealing and marking are as follows:

(a) Bidders submitting bids by mail or by hand shall enclose the original and each copy of the Bid, including alternative bids, if permitted in accordance with ITB 15, in separate sealed envelopes, duly marking the envelopes as “ORIGINAL”, “ALTERNATIVE” and “COPY.” These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB sub-Clauses 22.2.

22.2 The inner and outer envelopes shall:

(a) bear the name and address of the Bidder;

(b) be addressed to the Employer as indicated in ITB 22.1;

(c) bear the specific identification of this bidding process indicated in accordance with ITB 1.1; and

(d) bear a warning not to open before the time and date for bid opening.

23. **Deadline for Submission of Bids**  

23.1 Bids shall be delivered to the Employer at the address and no later than the time and date specified in the BDS. The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in
Section 1 - Instructions to Bidders

accordance with ITB 10.

24. Late Bids

24.1 Late bids shall not be considered. They will be returned unopened.

25. Withdrawal, Substitution, and Modification of Bids

25.1 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid submission Form or any extension thereof.

26. Bid Opening

26.1 The Employer shall open the bids at the time place and address specified in the BDS in the presence of Bidders’ designated representatives who choose to attend.

26.2 The bidders' names, the Bid Prices, the total amount of each bid, any discounts, any alternative bid, bid modifications and withdrawals, the presence or absence of bid security, and such other details as the Employer may consider appropriate, will be announced and recorded by the Employer at the opening.

E. Evaluation and Comparison of Bids

27. Confidentiality

27.1 Information relating to the examination, evaluation, comparison, and post-qualification of bids and recommendation of contract award, shall not be disclosed to Bidders or any other person not officially concerned with such process.

27.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.

28. Clarification of Bids

28.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its bid. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 31.

29. Determination of Responsiveness

29.1 The Employer’s determination of a bid’s responsiveness is to be based on the contents of the bid itself, as defined in ITB 13.

29.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission.

29.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 18, Technical Proposal, in particular, to confirm that all requirements of Section IV
(Employer’s Requirements) have been met without any material deviation, reservation or omission.

29.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

30. **Nonconformities, Errors, and Omissions**

30.1 Provided that a bid is substantially responsive, the Employer may waive any non-material non-conformity in the bid, request that the Bidder submit the necessary information or documentation, to rectify nonmaterial nonconformities in the bid related to documentation requirements but not related to any aspect of the price of the bid; and shall rectify quantifiable nonmaterial nonconformities related to the Bid Price.

31. **Correction of Arithmetical Errors**

31.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:

(a) only for unit price contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

32. **Margin of Preference**

32.1 **Unless otherwise specified in the BDS**, Margin of preference shall not apply.

33. **Evaluation of Bids**

33.1 The Employer shall use the criteria and methodology defined in this clause and no other evaluation criteria or methodologies shall be permitted.

33.2 To evaluate a bid, the Employer shall consider the following:

(a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill
of Quantities for admeasurement contracts or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively; and

(b) price adjustment for correction of arithmetic errors, discounts, non-conformities, due to the supplementary criteria as defined in Section IV, and Margin of Preference, if applicable.

33.3 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the contract combinations, including any discount offered in the Bid Submission Form, is specified in Section IV (Evaluation and Qualification Criteria).

33.4 If the bid for an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced, front loaded or substantially below updated estimates or if any item in the Priced Activity Schedule is front loaded or contains an erroneous amount in the opinion of the Employer, the Employer may after clarification require the Bidder to produce detailed price analysis for any or all items that the amount of the performance security be increased at the expense of the Bidder.

34. Comparison of Bids

34.1 The Employer shall compare all substantially responsive bids in accordance with ITB 33 to determine the lowest evaluated bid.

35. Qualification of the Bidder

35.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated substantially responsive bid meets the qualifying criteria.

36. Employer’s Right to Accept Any Bid, and to Reject Any or All Bids

36.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders.

F. Award of Contract

37. Award Criteria

37.1 Subject to ITB 36.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

38. Notification of Award

38.1 Prior to the expiration of the period of bid validity, the Employer shall, for contract amount above the prescribed
threshold, notify the selected bidder of the proposed award and accordingly notify unsuccessful bidders. Subject to Challenge and Appeal the Employer shall notify the selected Bidder, in writing, by a Letter of Acceptance for award of contract. The Letter of Acceptance shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Conditions of Contract and Contract Forms called “the Contract Price”) and the requirement for the Contractor to remedy any defects therein as prescribed by the Contract. Within seven days from the issue of Letter of Acceptance, the Employer shall publish on the Public Procurement Portal (publicprocurement.govmu.org) and the Employer’s website, the results of the Bidding Process identifying the bid and lot numbers and the following information:

(i) name of the successful Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded; and


38.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

39. Signing of Contract

39.1 Promptly upon issue of Letter of Acceptance, the Employer shall send to the successful Bidder the Contract Agreement.

39.2 Within twenty-one (21) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

40. Performance Security

40.1 Within twenty-one (21) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the conditions of contract, using for that purpose the Performance Security Form included in Section VIII (Contract Forms).

40.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement within the prescribed delay shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security.
**Preference Security**

40.3 The successful bidder having benefitted from a Margin of Preference shall provide a Preference Security, as specified in the BDS. The amount for the Preference Security shall be the difference between the price quoted by the selected bidder and that of the lowest evaluated bid which would have been selected for award of contract, if the said Margin of Preference was not applicable.

**41. Advance Payment and Security**

41.1 The Public Body shall provide an Advance Payment on the Contract Price as stipulated in the GCC, subject to a maximum amount, as stated in the BDS. The Advance Payment shall be guaranteed by a security as per the format contained in Section VIII.

**42. Plant and Materials on site**

42.1 Unless otherwise specified in BDS interim payment for Plant and Material on site is applicable as per GCC 39.7.

**43. Debriefing**

43.1 The Employer shall promptly attend to all requests for debriefing for the contract, made in writing, and within 30 days from the date of the publication of the award or date the unsuccessful bidders are informed about the award, whichever is the case, by following regulation 9 of the Public Procurement Regulations 2008 as amended.
# Section II- Bidding Data Sheet

## A. General

| ITB 1.1 | The Public Body is: National Assembly, Port Louis  
The project consists of Refurbishment of Lunch Room and kitchen at New Government Centre as detailed on drawings and specifications  
The name and identification of the Contract are: **Refurbishment of Lunch Room and kitchen at New Government Centre (OAB/NA/Q7/15-16)** |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB 1.2</td>
<td>The Intended Completion period is <strong>45 days</strong> from start date</td>
</tr>
<tr>
<td>ITB 2.1</td>
<td>The Funding Agency is: National Assembly</td>
</tr>
</tbody>
</table>
| ITB 3.2 | (a) The address to file Challenges in respect of this procurement is:  
  The Clerk of the National Assembly,  
  Parliament House,  
  Port Louis  
  (b) The address to file Application for Review is:  
  The Chairman  
  Independent Review Panel,  
  9th Floor, Wing B  
  Emmanuel Anquetil Building  
  Pope Hennessy Street  
  Port Louis  
  Tel: 2013921 |
| ITB 5.4 | The list of debarred firms according to the Debarment process may be obtained from the web site of the Procurement Policy Office: [ppo.govmu.org](http://ppo.govmu.org) |
| ITB 6.2 | The information required from bidders in ITB Sub-Clause 6.2 is modified as follows: [“none”]. |
| ITB 6.2 (c) | Contractors should have at least five years of experience for works. |
| ITB 6.2 (g) | The assessment of the financial soundness of the company shall be on a pass/fail basis on its overall performance including its profitability. |
| ITB 6.4 (a) | The Contractor must **either**:  
  (a) have a minimum average annual financial amount of construction of Rs …11,250,000………………… over the last…3…years. |
or

(b) have a valid registration grade of ……E………. with the CIDB.

| ITB 6.4 (b) | (A1) The Contractor shall demonstrate that it is registered with the CIDB with specialization in the following area(s)…Building construction works, Kitchen and laundry equipment, plumbing and drainage and miscellaneous mechanical equipment

Or

(A2) The Contractor shall demonstrate that it meets experience as prime contractor in the construction of a minimum of ……2……… works of a nature and complexity equivalent to the Works over a period of ……3 years

**In case the areas of specialization defined by CIDB does not cover this particular work, the second option (A2) shall be set mandatory.**

| ITB 6.4 (c) | The essential equipment to be made available for the Contract by the successful Bidder shall be: *Excavator, Compressor, Concrete mixer, vibrator and Jet frame or equivalent.*

| ITB 6.4 (d) | Key personal: One Contract Manager with a minimum of 5 years experience holding at least the Diploma in Building and Civil Engineering from the University of Mauritius or any similar qualifications. One General Foreman with minimum 5 years experience.

The electrical contractor shall have within its company the following qualified staff:

(a) One experienced Electrical Engineer registered with the Council of Registered Engineers of Mauritius to attend all site meetings and to act as the representative of the electrical contractor (which can be employed on a part-time basis).

(b) One experienced Electrical Technician holding the Part II Electrical Engineering Technician’s Certificate 280 or 803 of the City and Guilds of London.

(c) At least one experienced electrician holding the National Trade Certificate (NTC) in electrical installation works (Modules 1,2,3) issued by the Mauritius Examinations Syndicate and the IVTB.
The contractor shall provide:-
(i) all details including self-signed C.V., experience and qualifications of the above staff and
(ii) signed agreements from the persons to be deployed on site in this respect.

| ITB 6.4 (e) | The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be Rs 2,250,000 |
| ITB 6.5 | *The contractor must have a valid registration of grade E with the CIDB* |

### B. Bidding Documents

| ITB 8.1 | The Public Body’s address for clarification is: *National Assembly Port Louis* |
| ITB 9.2 | A *pre-bid meeting* has been scheduled for **Friday 19 February 2016 at 10.30 hours** |

### C. Preparation of Bids

| ITB 13 | Any additional materials required to be completed and submitted by the Bidders are [*“none”*]. |
| ITB 17.1 | The Contract *“is not”* subject to price adjustment in accordance with GCC Clause 44. |
| ITB 17.2 | Interim Payment for Plant and Material on site *“is”* applicable. |
| ITB 19.1 | The Bid shall be valid for **90 days** after the deadline set for the submission of bid, the deadline being counted as day one of the validity period. |
| ITB 20.1 | Bid shall include a subscription to a Bid Securing Declaration. |

### D. Submission of Bids

| ITB 23.1 | The deadline for submission of bids shall be **14 hrs on Tuesday 15 March 2016**. |
| ITB 26.1 | The Employer’s address for the purpose of Bid submission is **Clerk of the National Assembly, Level 3, New Government House, Port Louis** |

### E. Evaluation and Comparison of Bids

| ITB 26.1 | The bid opening shall take place at: *Lunch Room of the National Assembly, Level 3, New Government House, Port Louis* |
| ITB 26.1 | Date: **15 March 2016 at 14.15 hrs** |
### Section II – Bidding Data Sheet

| ITB 32 | 32.1 A Margin of Preference shall apply as defined hereunder and in Section IV-Evaluation Criteria. The following procedure shall be used to apply the Margin of Preference:  
  
  (a) responsive bids shall be classified into the following groups:  
    - Group A: bids offered by bidders meeting the conditions satisfying eligibility for a Margin of Preference, and  
    - Group B: all other bids;  
  
  (b) for the purpose of further evaluation and comparison of bids only, all bids classified in Group B shall be increased by the percentage(s) of preference allocated to those in group A.  
  
  32.2 Bidders applying for the Margin of Preference shall submit, as part of their bidding documents evidence of:  
  
  (a) their incorporation in the Republic of Mauritius;  
  (b) their Joint Venture Agreement or intention to legally enter into a Joint Venture Agreement to be incorporated in the Republic of Mauritius, where applicable;  
  (c) the percentage of the total man-days to be deployed by local manpower with break-down indicating type of works to be entrusted to the local manpower.  
  (d) A financial statement signed by a certified Accountant vouching that the annual turn-over of the local Small and Medium enterprise (where applicable) does not exceed Rs 50M. |
| F. Award of Contract |
| ITB 40.1 | The Standard Form of Performance Security acceptable to the Public Body shall be “a Bank Guarantee”. The Bank guarantee shall be (10 %) of the contract price inclusive of provisional and contingencies sum and VAT. |
| ITB 40.3 | For contracts up to 100M, the public body shall either retain money from progressive payments to constitute the preference security or request a security in the form of a bank guarantee at the selected bidder’s option.  
  
  For contract above Rs 100M, the preference security in the form of a bank guarantee issued from a local commercial bank shall be submitted at the time of contract award failing which the award of contract may be annulled. |
| ITB 41 | The Advance Payment shall be limited to 10 percent of the Contract Price less the provisional and contingencies sums |
| ITB 42.1 | Interim Payment for Plant and Material on site is applicable |
Section III - Bidding Forms

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Bid Submission Form

The Bidder must prepare the Bid Submission Form on stationery with its letterhead clearly showing the Bidder’s complete name and address.

Note: All italicized text is for use in preparing these forms and shall be deleted from the final document.

Date: _______________
Bidder’s Reference No.: _______________
Procurement Reference No:……………………

To:

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) Clause 10;

(b) We offer to execute in conformity with the Bidding Documents the following Works:

_________________________________________________________________

(c) The total price of our Bid after discounts, if any, offered in item (d) below is:

_________________________________________________________________

_________________________________________________________________

(d) The discounts offered and the methodology for their application are:

_________________________________________________________________

_________________________________________________________________

(e) Our bid shall be valid for a period of ________ [insert validity period as specified in ITB 19.1.] days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) We hereby confirm that we have read and understood the content of the Bid Securing Declaration attached hereto and subscribe fully to the terms and conditions contained therein, if required. We understand that non-compliance to the conditions mentioned may lead to disqualification.

(g) If our bid is accepted, we commit to obtain a Performance Security and a Preference Security (if applicable) in accordance with the Bidding Document;

(h) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 5.4;

(i) We are not participating, as a Bidder in more than one bid in this bidding process other than alternative offers submitted in accordance with ITB 15;
(j) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible under the laws of Mauritius;

(k) We are not a government owned entity / We are a government owned entity but meet the requirements of ITB 5.4;

(l) We hereby “apply/do not apply” for Margin of Preference as provided in the bidding document;

(m) We have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption as per the principles described hereunder, during the bidding process and contract execution:

i. We shall not, directly or through any other person or firm, offer, promise or give to any of the Public Body’s employees involved in the bidding process or the execution of the contract or to any third person any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

ii. We shall not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelisation in the bidding process.

iii. We shall not use falsified documents, erroneous data or deliberately not disclose requested facts to obtain a benefit in a procurement proceeding.

We understand that transgression of the above is a serious offence and appropriate actions will be taken against such bidders.

(n) We understand that this bid, together with your written acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(o) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and

(p) If awarded the contract, the person named below shall act as Contractor’s Representative:

_____________________________________________________________________

Name: ________________________________________________________________

In the capacity of: _______________________________________________________

Signed: ______________________________________________________________

---

6 Use one of the two options as appropriate.
7 Strike out as appropriate
Duly authorized to sign the Bid for and on behalf of: ________________________________

Date: ________________________________

Seal of Company ________________________________
Appendix to Bid Submission Form

Bid Securing Declaration

By subscribing to the undertaking in respect of paragraph (f) of the Bid Submission form:

I/We* accept that I/we* may be disqualified from bidding for any contract with any Public Body for the period of time that may be determined by the Procurement Policy Office under section 35 of the Public Procurement Act, if I am/we are* in breach of any obligation under the bid conditions, because I/we*:

(a) have modified or withdrawn my/our* Bid after the deadline for submission of bids during the period of bid validity specified by the Bidder in the Letter of Bid; or

(b) have refused to accept a correction of an error appearing on the face of the Bid; or

(c) having been notified of the acceptance of our Bid by the National Assembly during the period of bid validity, (i) have failed or refused to execute the Contract, if required, or (ii) have failed or refused to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We* understand this Bid Securing Declaration shall cease to be valid (a) in case I/we am/are the successful bidder, upon our receipt of copies of the contract signed by you and the Performance Security issued to you by me/us; or (b) if I am/we are* not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our* Bid.

In case of a Joint Venture, all the partners of the Joint Venture shall be jointly and severally liable.
Qualification Information

[The information to be filled in by bidders in the following pages shall be used for purposes of post-qualification or for verification of prequalification as provided for in ITB Clause 6. This information shall not be incorporated in the Contract. Attach additional pages as necessary. Pertinent sections of attached documents should be translated into English. If used for prequalification verification, the Bidder should fill in updated information only.]

1. Individual Bidders or Individual Members of Joint Ventures

1.1 Constitution or legal status of Bidder: [attach copy]
   Place of registration: [insert]
   Principal place of business: [insert]
   Evidence of signatory authorized to sign the bid (if applicable): [attach]

1.2 Annual amounts of construction works performed during the last [insert number] years [insert amounts in the national currency equivalent in the format given hereunder].

<table>
<thead>
<tr>
<th>Project name</th>
<th>Client</th>
<th>Client’s contact person</th>
<th>Contract Price MUR</th>
<th>Ongoing/Completed</th>
<th>Payment received (MUR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(yr) (yr) (yr)</td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[The selected bidder may be required, at post qualification assessment to submit, within seven days, written evidence for each of the listed projects certified by his client or by a professional (Engineer, Architect or Quantity Surveyor) having worked on those projects stating inter alia that the project was executed by the said contractor in its capacity as prime contractor. Bidders should therefore be prepared to submit these documents, if so required].

1.3 Number [insert number] of works of a nature and amount similar to the Works performed as prime Contractor over the last

---

8 This clause is not applicable for bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the grade that covers adequately the size and type of works related to the project.
[insert number] years. [Also list details of work under way or committed, including expected completion date(s).]

<table>
<thead>
<tr>
<th>Project/Contract name and country</th>
<th>Name of client and contact person</th>
<th>Type of work performed and year of completion</th>
<th>Value of contract (national currency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.4 Major items of Contractor’s Equipment proposed for carrying out the Works. [List all information requested below. Refer also to ITB Sub-Clause 6.4 (c).]

<table>
<thead>
<tr>
<th>Item of equipment</th>
<th>Description, make, and age (years)</th>
<th>Condition (new, good, poor) and number available</th>
<th>Owned, leased (from whom?), or to be purchased (from whom?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. [Attach biographical data. Refer also to ITB Sub-Clause 6.4 (d).]

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Years of experience (general)</th>
<th>Years of experience in proposed position</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.6 Proposed subcontracts and firms involved. Refer to General Conditions of Contract Clause 7.

<table>
<thead>
<tr>
<th>Sections of the Works</th>
<th>Value of subcontract</th>
<th>Subcontractor (name and address)</th>
<th>Experience in similar work</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Bidders have to ascertain that sub-contractors executing works of amount Rs 500 000 are duly registered with the CIDB where applicable in accordance with CIDB (Registration of Consultant) Regulation 2014.]

1.7 Financial reports for the last [insert number; usually 3] years: Financial Statements, Audited Accounts, etc. [List below and attach copies.]

---

9 This clause is not applicable for bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the field of specialisation that covers adequately the specialisation and complexity of works related to the project.

10 This clause is not applicable for bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the grade that covers adequately the size and type of works related to the project.
1.8 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of support documents.

1.9 Name, address, and telephone, telex, and facsimile numbers of banks that may provide references if contacted by the Public Body.

1.10 Information on current litigation(s) in which the Bidder is involved.

<table>
<thead>
<tr>
<th>Other party(ies)</th>
<th>Cause of dispute</th>
<th>Amount involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.11 Statement of compliance with the requirements of ITB Sub-Clause 5.4 (e).

1.12 Proposed program (service work and schedule). Description, drawings and charts, as necessary, to comply with the requirement of the bidding documents.

2. **Joint Ventures**

2.1 The information listed in 1.1 - 1.10 above shall be provided for each partner of the joint venture.

2.2 The information in 1.12 above shall be provided for the joint venture.

2.3 Attach the power of attorney or other acceptable document of the signatory (ies) of the Bid authorizing signature of the Bid on behalf of the joint venture.

2.4 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that

(a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

(b) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and

(c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

3. **Additional Requirements**

3.1 Bidders should provide any additional information requested in the Bidding Document.
Note: Clauses 1.2, 1.7 and 1.10 are not applicable for bidders having a Provisional Registration or bidders currently operating in Mauritius who are duly registered with the CIDB under the grade that covers adequately the size and type of works related to the project.

Clause 1.3 is not applicable where the field of specialization as categorized by CIDB referred to in the BDS by the public body covers adequately the specialization and complexity defined by the public body in the BDS.
Section IV - Evaluation Criteria

This section contains supplementary criteria that the Employer shall use to evaluate bids.

1. Evaluation

In addition to the criteria listed in ITB 33 the following criteria shall apply:

(a) Adequacy of Technical Proposal

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section V (Employer's Requirements).

(b) Multiple Contracts

Pursuant sub-clause 1.1 of the Instructions to Bidders, if Works are grouped in multiple contracts, evaluation will be as follows:

(c) Completion Time

An alternative Completion Time, if permitted under ITB 15.1, will be evaluated as follows:

(d) Technical Alternatives

Technical alternatives, if permitted under ITB 15.1, will be evaluated as follows:

(e) Margin of Preference

A Margin of Preference for employment of local manpower shall be applicable as follows:

1.1 For International Bidding

A bidder, incorporated in the Republic of Mauritius and employing local manpower for 80 % or more of the total man-days deployed for the execution of a Works contract, shall be eligible for a preference of 15 %.

1.2 For National Bidding

(i) A local Small and Medium Enterprise, having an annual turnover not exceeding Rs 50 million or a joint venture consisting of local Small and Medium Enterprises having an aggregate annual turnover not exceeding Rs50 million and employing local manpower for 80 % or more of the total man-days deployed for the execution of a Works contract, shall be eligible for a Margin of Preference of 20 %. 
(ii) Any bidder incorporated in the Republic of Mauritius not satisfying all the conditions mentioned in (a) above but employing local manpower for 80 % or more of the total man-days deployed for the execution of a Works contract, shall be eligible for a Margin of Preference of 10 %.

Note: Local manpower shall mean employees on the payroll of the Contractor as well as those for subcontractors executing works on the site.
PART 2 – Employer’s Requirements
Section V - Employer’s Requirements

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</tr>
<tr>
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<td>114</td>
</tr>
</tbody>
</table>
SCOPE OF WORK

The works consist of the following:

- Refurbishment of lunch room and kitchen
- Supply and fixing of kitchen equipment
- Plumbing works
- Installation of fire fighting equipments
Specifications (where applicable)

The Government of Mauritius Standard Specifications issued by the Ministry of Public Infrastructure Land Transport shall be deemed to form part of these tender documents, as every contractor registered with the Ministry of Public Infrastructure Land Transport has, de facto, a copy of the said Specifications.

All materials used in this project should be to the approval of the Architect and Engineer. With reference to the “Standard Specifications”, kindly note that:-

Page 35 of the “Standard Specifications”
An Approved Testing Authority is further defined as:-

(i) Materials Testing Laboratory
(ii) Mauritius Standard Bureau
(iii) The Laboratory of the University of Mauritius

PAINTS

External coating paints shall be waterproof and be guaranteed against discoloration, bacterial growth, cracking, chipping and peeling off from the masonry surfaces for a period of not less than Five (5) years.

All paints, stains and varnishes applied shall be eco-friendly with zero VOCs (Volatile Organic Compounds) or low VOCs (less than 5%).
ALUMINIUM WINDOWS AND DOORS

1.0 GENERAL

1.1 Submission
   1. Submit shop drawings
   2. Show detailed window assembly, including: large scale details of members and materials, of brackets and anchorage devices and of connection and jointing details fully dimensioned layouts for positioning of brackets and anchorage devices structures, dimensions gauges, thickness, glazing details, description of materials including catalogue members, products and manufacturer’s names, aluminium alloy and temper designations, finish specifications and all other pertinent data.

3. All the above submissions shall be duly signed by a registered Professional Engineer.

1.2 DELIVERY AND STORAGE

   1. Adequately protect aluminium and aluminium finishes to prevent damages thereto during fabrication, storage shipping, handling and installation.

   2. Deliver, handle and store units by methods approved by manufacturer. Protect from damage and staining.

   3. Protect stills and stools after installation with boards heavy paper or other suitable protection, secured in place, to prevent staining or scratching. Do not remove protection before final cleaning.

1.3 WARRANTY

   1. The contractor shall submit a warranty of five years in writing from the manufacturer.

   2. In addition to the above, insulating glass units shall carry manufacturer’s standard warranty of minimum five years for defective materials and ten years.

   3. The warranty shall include resistance to cyclonic winds of not less than 280 km/hr and water tightness.

   4. The contractor shall submit a certificate from a registered professional engineer certifying that Aluminium openings fixed in place shall withstand wind speed of not less than 280 km/hr. This certificate shall in no way waive or diminish the contractor’s liability towards the employer.

5. The contractor to fill and submit Form as per annexed.
2.0 PRODUCTS

2.1 MATERIALS
1. Aluminium extrusions: Shall be for the ALCAN, HUECK, TECHNAL, MUSKITA and ALUNION aluminium or approved equivalent of minimum 25 microns.
   (i) -60-
2. Finish clean anodized sections natural finish.
3. Bolts, screws and fasteners: Hot dipped galvanized or cadmium plated Steel or 302 stainless steel.
4. Glass: 6 mm clear glass.
5. Glazing Tape: Vulcanised butyl tape with continuous neoprene spacer, colour as selected by Architect.
6. Setting Block: Neoprene 10 mm long, 80A durometer.
7. Steel: Brake formed, galvanized sheet steel.

3.0 EXECUTION

DESIGN
1. Allow full expansion and contraction of window framing members without causing stress within the window assembly as result of such expansion and contraction.
2. Tolerate structural deflection and distortion structure, under design criteria conditions, without imposing load on window assembly

FABRICATION
1. Make profiles of framing members as shown on drawings.
2. Entire assembly shall be weather tight throughout.
3. Fabricate complete units in shop to provide minimum tolerance and hairline joints throughout.
4. Assemble members by stainless steel screws. All connections shall be internally sealed in factory with approved sealing compound. Exposed frame sealants are not acceptable.
5. Aluminium extrusions shall be designed to provide sufficient section modules to safety resist imposed loads but minimum thickness of any part of the load bearing extrusion shall be 3 mm. Glazing stops may be 6 mm. Be prepared to submit design date as requested by Architect.

6. Conceal interconnecting members and fasteners in completed assembly.

7. Do not place manufacturer’s name plates, labels or any other finished means of identification on exposed of finished parts.

8. Provide weep holes on tubular members to drain and condensation.

9. Glass stops shall provide edge margins recommended by glass manufacturer.

10. Paint all metal surface in contact with concrete or masonry, plastic, mortar or dissimilar metals with protective lacquer or bituminous coating.

11. Mitre and full strength vulcanize joints in weatherstripping.

4.0 INSTALLATION

1. Provide all fastenings or anchors required to be built in under work of other Sections.

2. Use only concealed fastenings.

3. Securely install components so that they line up square in true, straight flat and/or flush planes, plumb and level free from distortion.

4. Make joints neat and fine as practicable. Allow for full expansion and contraction and take into consideration climatic conditions prevailing at time of installation.

6. Fasten galvanized steel supports and clips with galvanized bolts and fasten aluminium members with stainless steel screws and bolts.

7. Ensure that corner joints of frames are weathertight.

8. Clean aluminium and glass surfaces that are to receive glazing materials with an oil removing solvent and wipe dry.

9. Glaze windows with factory glazed wrap around vinyl glazing channels.

10. Place setting blocks at quarter points for each type of glass.

11. Comply with tape manufacturer’s recommendations regarding use of spacers for certain glass sizes.
12. Install glass with clean cut edges, leaving spaces to expansion and contraction between edge of glass and inside of frame as recommended by glass manufacturer.

13. Finish tape and glazing wedge with straight unwaving sight lines.

14. Conform to sealant manufacturer’s written recommendations for cleaning, priming, backing and joint design to suit type and location of joint and temperature conditions at time of application.

15. Mask adjacent surface likely to become marred with sealant or primer, using non-thermosetting easily removed masking.

16. Apply sealant using pressure operated gun fitted with suitable nozzles approved by the sealant manufacturers. Apply in accordance with manufacturer’s directions and recommendations.

17. Apply sealant in such a manner as to assure good adhesion to sides of joints and to completely fill voids in joints. Form surfaces of sealant smooth, concave, free from ridges, wrinkles, sags, air pockets and imbedded impurities.

18. Remove masking tape, soils and sealant which may have been deposited on surfaces near joints.

19. Seal all window frames to adjacent materials both sides.

5.0 CLEANING

1. When directed, inspect work and remove protective wrappings, coatings and devices and clean glass and aluminium surfaces. Use methods which will not scratch or damage glass, paint or coatings.
CERTIFICATE FOR ALUMINIUM OPENINGS

In accordance with the requirements of (Clauses 1.1 and 1.3) of the Specifications of the contract for the Supply and fixing of Aluminium Openings for the project (Name of Project) .................................................................

.............................................................................................. I, the undersigned Registered Professional Engineer, hereby certify that the aluminium openings which have been fixed at (Location) ................................................................. have been designed to resist cyclonic winds of 280 Km/hr.

Name of Engineer: .................................................................

Registration Number with the Council of Professional Engineers: .................................................................

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

The following part is to be signed by the Contractor.

In the event of a failure of these openings due to cyclonic winds of 280 km/hr or less, (Name of Contractor) ................................................................. undertakes to replace these openings and make good all damages resulting from the failure of these openings.

Name: .................................................................

In the capacity of: .................................................................

Signed: .................................................................

Duly authorized to
Sign the certificate for and on behalf of: .................................................................

Date: .................................................................

Seal of Company: .................................................................
WATER SUPPLY AND WASTES INSTALLATION

SPECIFICATIONS
A. PIPINGS

Water pipings for the whole network shall be in UPVC pressure type, rated to withstand a pressure of 10 bars minimum. Dimensions shall be as appropriate, as indicted in drawings, UPVC pipes shall conform to relevant international standards (ISO R 161) BS 4514.

Joints shall be solvent welded by use of appropriate PVC solvent glue. Parts to be joined shall be cleaned first to remove all traces of grease and dirt before being glued together.

Screwed fittings shall be used wherever required to stop valves, flexible pipes etc.

At all user points, except for bib taps, chrome plated ringed flexible pipes shall be used.

Cold water pipings shall be pressure tested to 8 bars at completion of installation works.

A certificate to that effect is to be submitted.

Exposed UPVC pipes at roof shall be painted with anti UV paint and Contractor to include for all fixation above waterproofed roof so as not to pierce through the waterproofing.

Water supply pipings shall be fixed to walls, floorducts, services ducts, furniture panels, etc. by means of colour matching nylon mounting clips at intervals as per manufacturer’s specifications.

In addition to the stopcocks provided at each sink unit, appropriate easily accessible stop valves shall be provided in the network so as to enable each laboratory/floor to be isolated independently for maintenance purposes.

PLUMBING AND WASTES INSTALLATION

B. PLUMBING WORKS

(a) All water supply shall be “polycop pipes” with brass fittings except for underground water supply pipes which shall be “polypipes” with brass fittings or equivalent

(b) All internal water supply pipes shall be concealed in block works.

(c) Where surface mounted, all water supply pipes shall be fixed with approved clips of the same colour of the pipes.

(d) Appropriate stop valves shall be provided at easily accessible points so that the toilets and other blocks can be isolated floor-wise in case of leakages and for maintenance purposes. A minimum number of stop valves shall be provided as follows:

   (i) Entry and exits of all water tanks
   (ii) Each toilet block
(iii) After Central Water Authority Metre
(iv) Other blocks and water points

C WASTE PIPES

Waste pipes, waste water (except for laboratory waste) shall be in PVC of the appropriate dimensions and laid to fall 1:100 minimum.

Joints shall be solvent welded by use of appropriate solvent glue. Parts to be joined shall be cleaned thoroughly to remove all traces of grease and dirt prior to joining.

All joints are to be tested for leaks. A certificate to that effect is to be submitted.

PVC bottle traps are to be connected at discharges from wash hand basins and sinks.

All waste pipes are to be connected to catchpits and rodding eyes shall be provided at all changes in direction.

D TESTING AND COMMISSIONING

All piping work is to be done neatly and to the entire satisfaction of the Architect.

Water supply pipes are to be pressure tested to 8 bars pressure and held for at least 8 hours to test for leaks.

Pipes shall be properly supported along walls by means of saddles, PVC clips, etc.

Waste pipes shall be tested for leaks at all joints.

Certificate of testing shall be submitted to the Architect on commissioning.

As-made drawings are to be submitted in 3 copies on commissioning.

TIMBER SPECIFICATIONS

TIMBER FOR WORKTOPS

Timber used for all work benches and wall benches (worktops and structural members for both) shall be solid iroko timber of thickness as specified in the drawings of wherever not mentioned. The timber shall be kiln dry and of minimum moisture content of 125.

The timber used should be guaranteed for a period of 5 years after handing over against warping, cracks, shrinkage and distortion.

All finishes shall be as specified in the drawings and to Architect’s approval.
Contractor to include all joineries not specified in the drawings that may be required during manufacture of furniture as per drawing.

Contractor to allow for cutting out of worktops for fixing vulcathene sinks. Care must be taken to have net joints to the satisfaction of the Architect.

Timber used for glazed cupboards shall be sapele or as specified in the drawings.

A Certificate for moisture content shall be submitted to the Architect prior to mass production.

In case MDF boards are specified for the racks, a Certificate of the density of the material shall be submitted as well as damp-proofness.

All drawers, cupboards, lockers and worktables shall have locks as per standard specifications.

Glass panes used shall not be less than 4 mm and samples should be submitted for approval by Architect.

Metal sections shall be hot-dipped galvanized after manufacture, primed and painted as per architect’s specifications.

PODIUMS

The podiums shall be as the standard sheet and supplied as specified in the layouts. The vinyl flooring over the podiums shall be to EN 649 and BS 3261, of total thickness 2.55 mm thick with a wearlayer of 0.75 mm. All joints shall be seamed welded and colour to Architect’s approval.

JOINERY WORK GENERALLY

All joiner’s work generally shall be cut and framed together on the commencement of the works, but shall not to be wedged up or glued until the building is ready for fixing same.

All work shall to be properly, tenoned, shouldered, wedged, pinned, bradded, etc. as directed and to the satisfaction of the Interior Designer and all properly glued up with best quality approved glue. Oval or round brads or nails shall be used for fixing on face work, heads properly mails punched in and the holes filled with putty or as otherwise described.

FINISH TO WOODWORK

All exposed faces of woodwork shall be wrot, which shall mean bringing up the surface after planning with sand paper to a smooth satin like finish.

DOOR FRAMES AND LININGS
Door frames and linings shall be constructed to the sizes and details shown on the drawings. Joints between style and head shall be mitred.

Fixing irons shall consist of 300 mm long g.m.s hoop not less than 3 mm thick bent up at 75 mm at one end and twice screwed to the frame and the other end built into the walls, and cast into lintols to the depth of 225 mm deep, the straps shall be cut off to the full depth of the lintol.

10 mm diameter galvanized metal dowels shall be fixed to each end of the frames and let into the floor concrete to a depth of at least 50 mm.

Door linings shall be screwed to wooded fixing dovetail shaped and let into the walls and lintol with the same number of fixing irons to frames.

DOORS

Doors shall be provided and fixed to the sizes and details shown on the drawings. Doors shall be free from all blemishes and shall be rubbed down to a satin like finish. Framed, ledged and braced doors shall be made to the sizes shown on the drawings and the nailing in construction shall be driven from the face side, the heads of nails shall be punched and the holes filled with putty.

Butts and hinges shall be to the sizes and type specified and be fixed with the full number of screws and on no account shall nails be used.

PLYWOOD

Plywood shall be to the specified thickness and shall comply with BS 1455, plywood shall be Grade 1 where varnished and Grade 2 where painted. Concealed side of plywood can be Grade 3.

GLUES

All glues to be used for joinery works shall be the best of their respective kind and shall conform to BS 745,1444,1203 and 1204.

SCREWS

Screws to be used for the joinery works shall be brass and shall conform in every respect to BS 1210.

NAILS

Nails shall be galvanized mild steel wire nails – all on accordance with BS 1202.

MOISTURE CONTENT OF TIMBER

The Contractor is to ensure that the moisture content of the various items if joinery delivered to the site should be at least 12%.
SHRINKAGE

The arrangement, jointing and fixing of all joinery works shall be such that shrinkage in any part and in any direction shall not impair the strength and appearance of the finished work and shall not cause damage to contiguous materials or structure.

TOLERANCE

Reasonable tolerance shall be provided at all connections between joinery works and the building carcass, whether of masonry or frame construction, so that any irregularities, settlements or other movements shall be adequately compensated.

FABRICATION

The joiner shall perform all necessary mortising, tenoning, grooving, matching, tonguing, housing, rebating and all other works necessary for correct jointing. He shall also provide all metal plates, screws, nails and other fixings that may be ordered by the Interior Designer or that may be necessary for the proper execution of the joinery works specified. The joiner shall also carry out all works necessary for the proper construction of all framings, linings, etc. and for their support and fixing in the building.

JOINTS

The joinery shall be constructed exactly as shown on the Interior Designer’s details. Where joints are not specifically indicated they shall be the recognized forms of joints for each position.

The joints shall be made so as to comply with BS 1186, Part 2: 1971.

Loose joints are to be used where provision must be made for shrinkage or other movement acting other than in the direction of the stresses of fixing or loading. Glued joints are to be used where provision need not be made for shrinkage or other movements in the connections, and where sealed joints are required.

All glued joints shall be cross-tongued or otherwise reinforced.

All nails, sprigs, etc., are to be punched and puttied.

Where glued joints are to be carried out surfaces in contact are to have a good swan of planed finish. All cutting edges of tools are to be sharp to avoid “burnishing”. The surface of plywood to be glued should be lightly dressed with sand or glass paper. The sand or glass paper must not be allowed to clog and cause “burnishing”.

Members in constriction to be joined by gluing are to be of similar conversion. All surfaces to be glued are kept clean, free from dirt, sawdust, oil and any other contamination.

Adequate pressure should be applied to glued joints to ensure intimate contact is maintained whilst the glue is setting.
Mixing application and setting conditions should be in accordance with the glue maker’s instruction.

“Adhesives” for joints in non-loadbearing internal work and for joints in work where the moisture content is always less that 16 per cent can be casein or organic glues.

For work under damp conditions (moisture content normally 20 per cent or more or conditions liable to fungal attack): resin type adhesive are to be used.

SCRIBING

All skirtings, architraves, plates and other joinery works shall be accurately scribed to fit the contour of any irregular surface against which they may be required to form a close butt connection.

FLUSH DOORS

Flush doors shall be semi-solid cored and shall be lined on both sides with 4 mm Grade 2 plywood for painting or 4 mm Grade 1 teak plywood where shown.

The doors shall be lipped with 10 mm thick hardwood strips on (4) for sides and shall be fitted and hung to frames as detailed on drawings and specified previously.

Doors shall otherwise conform to BS 459.

PROCEDURE

MEASUREMENTS FOR JOINERY

The Contractor is to take all measurements for joinery works at the building, and not from the Interior Designer’s drawings, except where the work is specified to be “built in”.

FIXED-IN-JOINERY

Where joinery works are specified to be “fixed-in” or inserted in the positions, they are to occupy after the surrounding or enclosing carcass has been constructed. It shall be the responsibility of the contractor to ensure that the necessary fixings are incorporated in the carcass. Alternatively, the Contractor shall construct such ground works as are required to provide a suitable base and fixing for the joinery works. The spaces enclosed in the ground works and behind joinery works, shall be filled in solid with plaster. The Contractor is to secure “fixed-in” joinery works so that they are plumb and true to the shapes and dimensions shown on the working drawings and details. Vertical junctions shall be solidly bedded with mortar, wedged or otherwise secured, as may be specified or as is most appropriate in the circumstances, but a clearance is to be maintained in all
overhead junctions so that settlements in the building carcass may take place without stressing or otherwise loading the joinery works.

Joinery works shall not be fixed in position until after all floor, wall and ceiling surfaces have been formed or constructed, unless otherwise specified.

JOINERY ASSEMBLED IN-SITU

Where joinery works are specified to be “assembled in situ” and all stresses of support and fixing are to be engaged in the building, it shall be the responsibility of the Contractor to ensure that the necessary fixings are incorporated in the carcass; alternatively, the Contractor shall construct such ground works as are required to provide a suitable base and fixing for the joinery works.

The spaces enclosed in the ground works and behind the joinery works shall be filled in solid with plaster or weak concrete.

In situ joinery works shall not be executed until after all floor, wall and ceiling surfaces have been formed or constructed, unless otherwise specified.

DRAWINGS

Work is not started until the Interior Designer has approved the manufactured full-size setting out drawings to be provided by the Contractor. Suggestions which the manufacturer may wish to make modifying the construction and joints shown on the Engineer’s drawings will be considered.

INSPECTION

Facilities are to be given for the Interior Designer to inspect all work in progress in shops and on the site.

TIME FOR DELIVERY

None of the joinery is to be delivered until it is required for fixing in the building. Joinery which does not require to be built in as the work proceeds is not to be brought to the site and fixed until the building is enclosed.

TRANSPORT AND PROTECTION

The joinery is to be kept under a waterproof cover during transit and it is to be similarly covered and kept clear of the ground on the site. It is to be handled and stacked carefully to avoid damage.

MAKE GOOD DEFECTIVE WORK
Should any shrinkage or warping occur or any other defects appear in the joiner’s work before the end of the defects liability period such defective work is to be taken down and renewed to the Interior Designer’s satisfaction and any work disturbed in consequence must be made good at the Contractor’s expense. Should any shrinkage or warping occur or any defects appear, which cannot be rectified the Contractor shall remove such defective work and replace by new one at his own expense.
Mechanical specification
Scope of works for plumbing and firefighting installations at National Assembly shall consist of the following:

(i) Cold water system  
(ii) Hot Water system  
(ii) Waste and Sewage system  
(iii) Fire fighting system

The contractor shall supply, install, deliver, test and commission each of the above works to the full satisfaction of the Mechanical Engineer.

The contractor shall ensure that he delivers a complete installation in working order and which suits the specifications defined in the present documents and which is fully conformed to the latest relevant British standards.

These documents are meant to be a general guide to the Contractor and are not meant to replace applicable codes of practice and regulations, nor shall they provide him with any excuse for claiming additional costs and for not executing the job to the full satisfaction of the Mechanical Engineer. Any discrepancy or other irregularity shall be notified to the Mechanical Engineer immediately for any rectification.

The tender drawings submitted with these specifications are intended to provide the contractor with the design concept and illustrate the general layout of all equipment and distribution systems. These, together with the specifications give sufficient information to enable the contractor to estimate the cost and to determine how the system must be installed, tested, operated, serviced and maintained.

Locations and dimension shown are only indicative routes and zones in which the above mentioned mechanical services must be installed.

The contractor shall produce appropriate shop drawings for all mechanical installations and submit same to the Mechanical Engineer for approval. All mechanical installations executed on site shall be as
per Contractor’s detailed shop drawing duly approved by the Mechanical Engineer.

“As Built” drawing shall be submitted by the contractor on completion of the works. The works shall not be certified as being complete unless these drawings and all Operating and Maintenance manuals have been submitted.

**Cold water system**

The present domestic cold water booster system comprises of the following:

1) Calpeda M90 V1-2.2T, 2.2 KW (2 units) on sequential mode.
2) Salmson MOT3-QSFC 112M2C-40H, 5.5 KW (1 unit) on standby mode.
3) 500 liter Calpeda Pressure vessel.

The cut in pressure is 4.5 bar and the cut out pressure is 6 bar.

Cold water pipe work shall be UPVC Pressure type, to withstand a pressure of 16 bar.

Joints shall be solvent welded by use of appropriate PVC solvent glue. Parts to be jointed shall be firstly thoroughly cleaned before being glued together.

Pipe embedded in flooring or block wall should run through UPVC sleeve, two diameters larger, stiffness SN8.

Solvent welded screwed fitting shall be used wherever required namely at stop valves, flexible pipes, etc.

Each sanitary appliance shall be fitted with individual isolating valve. Each accessible stop valves shall be provided in the network so as to enable each floor and different sections to be isolated independently for maintenance purposes.

Nylon mounting clips or saddles as required shall be positioned at intervals as per manufacturer’s specifications.

All screws, bolts, nuts, fasteners etc. shall be of stainless steel.

All water pipe work and fittings shall be pressure tested to 8 bar.

All flexible hose fitting shall be chrome plated.
A wall mounted wash-down hose reel shall be provided next to the cooking appliances at level 2. It shall be fitted with a reel, 25m heavy duty rubber hose and complete with isolating valve and gun. All cold water connection shall be tapped off from existing cold water network to the nearest riser. Position of riser, as indicated on drawings, are indicative only. Successful bidder shall take cognition of exact location of riser before execution of work and any modification(s) to be brought to the existing network shall be quote in the price activity schedule.

**Hot water system**
Hot water piping shall be of copper pipe to BS 1057. Hot water shall be provided at all sinks and at La plonge.

**Electric Instantaneous water heater**
Wall mounted electric Instantaneous sink water heater with stainless steel support and bolt
Automatic switch on/off upon opening/closing of tap through flow switch
Maximum operating pressure: About 10 bar
Minimum water flow to activate unit: About 2.5 l/min
Rated power: About 7 kW
Supply voltage: 220-240 V
Warranty Period: Minimum one year
Country of origin: Europe
Pipe connection from electric water heater to mixer shall be of copper pipe conforming to BS EN 1057.
Bidder shall taking into consideration the operating pressure of the cold water booster system so that the proposed instantaneous water heater is able to sustain the flow rate and operating pressure.

*If the bidder feels necessary to include any device(s) so as to meet the requirement of the heater, the latter shall make necessary provision in the price activity schedule.*
**Gas Installation at National assembly**

The successful bidder shall design, supply and install, test and commission all pipeworks associated with gas installation. The contractor shall liaise with the client i.e National Assembly to take cognizance of the capacity, in terms of KW for the following gas-fired equipment.

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>(i) Teplan</td>
<td>2</td>
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<tr>
<td>(ii) Piano</td>
<td>2</td>
</tr>
<tr>
<td>(iii) Gas High Pressure</td>
<td>3</td>
</tr>
<tr>
<td>(iv) Bascule Sauteuse</td>
<td>1</td>
</tr>
<tr>
<td>(v) Gas fryer</td>
<td>1</td>
</tr>
<tr>
<td>(vi) Bain Marie</td>
<td>1</td>
</tr>
<tr>
<td>(vii) Boiler rice/Pattes (150P)</td>
<td>1</td>
</tr>
</tbody>
</table>

At the time of implementation, the contractor shall liaise with the local gas supplier of the government so that safety measures are implemented as per his advice.

**Copper manifold**

Gas cylinder shall be connected to a copper manifold via high pressure hose to BS 3212: 1991 Part 2. The manifold shall be rigidly held against the wall above the gas cylinders by means of fixed saddles and screws.

**Stop valves**

The manifold shall have quarter turn valves which shall enable removal of any cylinder without affecting the system.

**1\textsuperscript{st} stage regulator**

A first stage regulator shall be installed at the manifold. This device is to regulate the output pressure to 1.5 bar with an inlet pressure of about 10 bar. This device shall incorporate an automatic change-over system complete with non return valves. It shall causes automatic use of other gas cylinder when one cylinder is empty.

**2\textsuperscript{nd} stage regulator**

A second stage regulator shall be installed at each gas equipment point. The second stage regulator shall limit the outlet gas pressure to 28mbar for butane. This device shall meet BS 3016:1989.
Gas Pipings
Gas pipings shall be in copper to BS 2871. Pipings shall have brazed welded fittings. Pipings shall be rigidly held by means of supports, saddles, etc. Proper warning tape shall also be provided.

Emergency stop valve
An emergency stop valve shall be located at the door exit and shall be installed in a metal cubicle. It shall have its door kept locked at all times, with a transparent glass on which sticker `GAS EMERGENCY VALVE- BREAK GLASS` is to be placed.

Specification for Waste pipes
Waste Pipe shall conform to BS EN 1566-1
Waste Pipe shall be chlorinated polyvinyl chloride C-PVC and conform to BS EN 1566-1
All pipes shall be pressure tested according to BS EN 12056-2 NG.3 Testing
Rodding eyes with screwed cap shall be provided at all changes in direction and where required
Joints shall be thoroughly cleaned before being glued and shall use appropriate solvent weld
All sinks shall be fitted with stainless steel 316 p-traps complete with coupling and drain plug
All pipes shall be thoroughly cleaned with PVC Cleaner, properly chamfered before being glued and shall use appropriate solvent weld before joining
All waste pipes shall discharge into existing outlets. Position of existing outlets, as indicated on drawings, are indicative only. Successful bidder shall take cognition of exact location of waste outlet before execution of work.

Fire Fighting System
The requirements for firefighting are as follows:
i) **For kitchen:**

(a) One 4 kg dry powder
(b) Two Fire Blanket conforming to BS EN 1869:1997
(c) R-102 Fire suppression system for Kitchen hood conforming to NFPA 96 & NFPA 17A

ii) **For Lunch room:** One 4 kg dry powder

Portable fire extinguisher shall conform to BS 5306 – Part 8 (2006). The extinguishers shall be sited in such a way that its carrying handle lies 1 meter from the floor level. Provision of signage for fire extinguisher. The lettering shall be red on a white background.

iii) Detailed specification for R-102 Fire suppression system for kitchen hood

The sub-contractor undertaking the work shall have at least five years experienced in this specialized field. The system shall comprise of an automatic pre-engineered R-102 Fire suppression system to protect the kitchen hood area. The contractor/sub-contractor shall design, supply, install, test and commission the whole installation. The system shall be a low pH wet chemical agent, storage system, regulated pressure type, heat detection system, release mechanism, associated piping system and nozzles. It shall be automatic and remote manual actuation.

The system shall incorporate an additional safety feature whereby it shut-off the gas applications. The sub-contractor shall coordinate its activity with the appointed government gas supplier for the aforementioned feature. The system shall allow also for shut-off of electrical switches in case of release. Each nozzle shall have a blow off cap to keep the nozzle tip orifice free of cooking grease build up.

Distribution pipe shall be schedule 40 black iron.
Warranty: The system shall have a minimum of five years from commissioning date against workmanship and material.

Operating and maintenance manuals shall be submitted in three hard copies with plastified covers.

Piping design drawings shall be submitted in three hard copies.
Specifications

For

Electrical works
Scope of works

The scope of works shall consist of the following:-

a) Removal of existing M & E services as stated in the spec or by instruction of ESD Engineers;

b) Reconnection of Electrical Installation as required;

c) Supply, install, test and commission of control panels, distribution boards, lighting fittings & accessories, etc.

d) Supply, install, test and commission of L.T. cables in conduit.

e) Supply, install, test and commission of Earthing System, etc.

f) Supply, install, test and commission of sockets, switches, extractor fans, etc…

g) Supply, install, test and commission of fire alarm system including detectors, manual call points, sounders, main panel, repeater panel etc.

h) Supply, install, test and commission of one package type HVAC system with new ducting works.

i) Reconditioning works for the existing ducting in the Kitchen of NGC;

j) Supply, install, test and commission of Extractor Fan and associated accessories;

k) Supply, install, test and commission of Machine Room-Less Elevator complete with all accessories.

l) Provide one year warranty and free maintenances on the M & E Services;

m) Factory Inspection for the Elevator and Package Type HVAC;

n) Any other associated works related to the above to make the system fully functional;

1.0 Instruction to tenderers

1.1 Makes

Equipment/materials for this project shall be as per specifications/schedules or as indicated on the drawings. Tenderers shall specify clearly the makes of various equipment/materials they propose to use. These shall be accompanied by documentation (preferably in original) to enable the Director (or designated representative) of Energy Services Division (ESD) to approve or otherwise.

The decision of the Director (or representative) shall always be final and no materials/equipment shall be supplied or installed in the project without his approval or that of his representative.
Manner of Execution

The works shall be executed in the manner set out in the specifications or where not set out, to the satisfaction of the ESD Engineer and all reasonable variations on site shall be carried out in accordance with such directives as the Engineer may give.

Electrical installations shall be carried out to good standards of workmanship and all equipment, materials and fittings shall be new and according to specifications. Where no details have been provided, products shall be manufactured to the British Standards applicable to the particular product. All items given in drawings are indicative only. Exact positions shall be finalised with the Engineer prior execution of works.

1.2 Site Exigencies

The selected contractor shall respect security arrangements in force and shall seek necessary permission and security pass for yard access, if any for execution of the work. The contractor shall carry out works outside normal office hours where deemed necessary and authorised by ESD Engineer without any increase in contract cost. Claims for overtime works shall not be entertained. The site shall be kept tidy and no materials/refuse shall be kept which may cause obstructions.

For any information, please contact Mr. S. M. R. Auckloo, Electrical Engineer/ Senior Electrical Engineer, Energy Services Division, 2nd Floor, New Government Centre, Port Louis, Tel No: 201 1021 or 201 3636.
2.0 Conditions of Contract

2.1 Site Visit
Bidders are advised to visit the sites before submission of tender so as to be fully acquainted with the nature of the site and extent of work involved. Bidders shall contact Client Ministry and ESD Engineer for site visit arrangement.

2.2 Price Activity Schedule, Schedule of Rates & Schedule of Materials
The bidders shall fill in the, Priced Activity Schedule, and Schedule of Materials, and submit same together with the bid documents.
This schedule has been prepared with a view to provide a common basis for tendering. Before submission of tender, it is deemed that the bidder has acquainted him with all conditions prevailing on site. All the drawings, specifications and Priced Activity Schedule are complementary and should be read accordingly. The tenderers are advised to carry out measurement and check the quantities of materials.
In case of discrepancies, omissions or errors, the tenderer shall inform the Director of the ESD prior to submission of the tender. No extra claim shall be entertained afterwards on this issue.

2.3 CEB Supply
The contractor shall liaise with representatives of the CEB for any power cut required on the main panel. The contractor shall allow in the Priced Activity Schedule for assistance from the CEB.

2.4 Warranty Period
The electrical installation shall be guaranteed against manufacturing defects, bad workmanship and other defects not related to normal wear and tear for a period of one year from date of successful commissioning in presence of representatives of ESD.
In the event of a defect, the Contractor shall at his own expense, within 48 hours, make good such defects as instructed to the satisfaction of the Engineer.
2.5 **Provisional /Contingency Sum**

Provisional/Contingency sum included in the contract price shall be expended or used as the Engineer may in writing direct and not otherwise. In so far as the provisional/contingency sum included in the contract price is not expended or used, it shall be deducted from the contract price.

2.6 **Programme of Work**

The tenderer shall clearly indicate in the offer the time period for the execution and completion of the installations for the whole project. A tentative programme of work must be submitted for tender evaluation. However, if not submitted, the BEC may request to the Bidder to submit the programme during the Evaluation procedure of the bids.

All test certificates and as fitted drawings shall be approved and signed by the Electrical Engineer before submission to the Client.

3.0 **Technical Specifications - Electrical**

3.1 **Electrical Installations**

This section provides a brief description of the electrical works related to this contract. The selected Electrical Contractor shall carry out the works to the full satisfaction of the Director of ESD or his representatives.

3.2 **Regulations**

The electrical installation shall be conformed to the standard set in the 17th Edition of the IET Wiring Regulations (B.S 7671:2008 incorporating all recent amendments) and to Mauritian Standards, if any.
3.3 **Electrical Supply**

The NGC building is being supplied by two 1000kVA transformers. The electrical power for each distribution board shall be provided as per electrical schematics or shall be specified by the engineer during the site visit or during implementation period.

3.4 **Electrical Panels (SSDB1, SSDB2, SSDB4)**

The distribution boards (DBs) shall be to IP 31 and shall be of galvanised steel with polyester paint finish, hinged transparent lockable door. The panel shall be big enough to accommodate incoming and outgoing feeders and the following:

1. MCCBs/MCBs, and RCBOs as per schematic layouts.
2. Copper Earth Bar Terminal with suitable number of outlets & sizes.
3. All accessories to make a complete panel.

The distribution boards shall be wall mounting. All switchgears in the main distribution board shall be of minimum 10 kA breaking capacity.

All circuits and instrument in the board shall be properly labelled with perspex and danger notices fixed on panels. Plasticised schematic layout shall be fixed in respective Distribution Boards.

Panels shall be located as shown in drawings and shall be properly earthed. 30% of spare capacity shall be allowed. There shall be ample space in the panel to allow for easy access when required for manual work.

3.5 **Electrical Panels (SDB1, SSDB3)-630A Minimum**

The distribution boards (DBs) shall be to IP 55 & IK 10 and shall be of galvanised steel with polyester epoxy powder paint finish, hinged transparent lockable door. The panel shall be big enough to accommodate incoming and outgoing feeders and the following:

4. MCCBs/MCBs, and RCBOs as per schematic layouts.
5. Copper Earth Bar Terminal with suitable number of outlets & sizes.
6. All accessories to make a complete panel.

The distribution boards shall be **floor mounted**. All switchgears & the main distribution board shall be of minimum 50 kA breaking capacity.

All circuits and instrument in the board shall be properly labelled with perspex and danger notices fixed on panels. Plasticised schematic layout shall be fixed in respective Distribution Boards.

Panels shall be located as shown in drawings and shall be properly earthed. 30% of spare capacity shall be allowed. There shall be ample space in the panel to allow for easy access when required for manual work.
3.6 **Energy Management System**

One complete new *energy management system* with *energy meters* (EM) (log of minimum 2 years) shall be installed near the main distribution board. The energy management system shall be:

- Read, Record and view past data through a LCD panel on the controller
- Data accessible on Microsoft excel format
- Logging for minimum of 3 years
- 1.2 km on Modbus
- Incorporating capability of minimum 20 compatible energy meters
- Easy plug and play modules
- Data accessible and retrievable through a laptop (modem/cable to be supply together)
- Software with all level passwords
- Wired to one computer (to be selected by user) for viewing and retrieval of data.

The E.M. shall read the minimum following parameters:-

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Cos Phi</td>
</tr>
<tr>
<td>Ampere</td>
<td>High &amp; Low kVA</td>
</tr>
<tr>
<td>Power Consumed</td>
<td>Frequency</td>
</tr>
</tbody>
</table>

Note: The E.M. shall be either single phase or three phase as required.

3.7 **Switchgears**

3.7.1 **Moulded Case Circuit Breakers**

Moulded Case Circuit Breakers shall be of 4 pole-TPN type, 400V, 50Hz and shall be fixed type fitted with trip free manually closing mechanism. They shall be designed and tested to B.S. 4752 and shall be provided with an inverse time delay and adjustable thermal release (0.7/1 In) as well as necessary accessories. The trip devices shall be direct acting. They shall have a minimum breaking capacity of 50 kA & adjustable thermal and magnetic release (Thermal release: 0.7 – 1 In & Magnetic release: 3.5 – 10 In). It shall also incorporate the following:

(i) Positive opening indication;
(ii) Test button for mechanical release control;
(iii) Rotary handle on the front of the unit shall be fitted only where specified
(iv) Adjustable earth leakage module (0.03 A – 3 A) shall be fitted only where specified.
3.7.2 Miniature Circuit Breakers (MCB)

MCB’s shall be of reputed make and break type with trip free mechanism to BS 3871/ IEC 60947-2. They shall be equipped with non-adjustable thermal overload and magnetic short circuit release with a minimum breaking capacity of 10 kA.

3.7.3 Residual Current Circuit Breaker (RCCB)

Residual Current Circuit Breaker (RCCBs) shall be associated with MCBs on all final circuits. They shall provide protection against earth leakages. The RCCBs shall be of sensitivity 30mA.

3.7.4 Residual Current Operated Circuit Breaker with Overload Protection (RCBO)

This shall be a single unit having the properties of both a RCCB and a MCB, as described above.

3.8 Type of Installations

The installation is designated to be of Concealed Type where possible. PVC conduit pipes of yellow or orange colour complying with the relevant British Standard shall be used. The conduit shall provide adequate mechanical protection for the enclosed cables. Cut ends of conduits shall have no burrs left to avoid damage to the insulation of conductors while pulling them through. Conduits shall be installed from point to point using suitable drawing-in or loop-in boxes. Joints shall not be allowed.

The laying of conduits shall be such that any condensation inside the conduit is drained out. The casting of conduits in concrete shall be laid in such a way that will prevent any movement when the concrete is being cast. The conduit shall be securely tied with the reinforcement. The conduit shall terminate into end and loop-in boxes which shall also be tied securely with the reinforcement and these shall be so positioned that after the concrete is cast and the shuttering removed, the boxes are flush with the concrete.

3.9 Conduit in Block-work

When the conduits are to be recessed in concrete blocks a chase shall be made in the concrete block. The conduit shall be properly secured in the chase which shall be made good afterwards.


3.10 **Inspection Boxes**

Suitable inspection boxes to the nearest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires if necessary. The inspection/junction boxes shall be mounted flush with the wall or ceiling concrete. Suitable ventilating holes shall be provided in the inspection where required.

3.11 **Fish Wire**

To facilitate drawing of cables in the conduits fish wire 18 swg shall be provided along with laying of recess conduit, the entire conduit system including those for outlets and boxes shall be thoroughly cleaned after completion of erection and before drawing of cables.

3.12 **Cabling & Wiring Works**

Single core PVC insulated 600V grade copper conductor manufactured in accordance with BS 6004, shall be used for wiring inside conduits for internal wiring.

Main and sub-main cables shall be generally of 1 kV grade conductor of high conductivity copper wires insulated with PVC.

The armoured underground cables shall be routed through yellow/orange high pressure PVC pipes in trenches as per drawing. They shall run in continuous lengths; no cable joint shall be permitted. The contractor shall make all necessary allowance in his quotation for any trenching work which shall include excavation and backfilling as well as erection of pits.

Cables shall comply with relevant BS and Mauritian Standards. Conduit of adequate dimension shall be used where necessary in order to satisfy cable space factor.

Latest IEE standard colour code shall be observed.

3.13 **Lighting Installations**

All luminaires shall comply with BS 4533 and supplied and installed complete with their lamps and control gear as specified.

Where specified, lighting fixtures shall be provided with LED lights module with long life span of 50,000 hours and with heat dissipating capability.

All luminaires shall be manufactured to British or European Standards and shall be in accordance with the schedule given hereunder.
### Schedule of Lighting Fixtures

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Location</th>
<th>Type</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Lunch Room</td>
<td>Type A</td>
<td>Recessed Lighting Fixture- 600 X 600- LED -2700 lumen- 3000K- White Colour-Slim – Dimmable - 25W</td>
<td>(similar to CoreLine RC120B, warm white)</td>
</tr>
<tr>
<td>2.</td>
<td>Lunch Room</td>
<td>Type B</td>
<td>Recessed Lighting Fixture- 600 X 600- LED -2700 lumen- 4000K- White Colour-Slim – Dimmable - 25W</td>
<td>(similar to CoreLine RC120B, cool white)</td>
</tr>
<tr>
<td>3.</td>
<td>Lunch Room</td>
<td>Type C</td>
<td>Track Lighting System- Spot LED-Movable-Warm White – Narrow Beam – 10 Watt – Chrome Colour – CRI 85</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Lunch Room</td>
<td>Type D</td>
<td>LED 4 feet lighting Fixture – polycarbonate cover – 4000K – Waterproof- 2 x LED tubes 25W</td>
<td>(similar to Philips , Pacific)</td>
</tr>
<tr>
<td>5.</td>
<td>Lunch Room &amp; Kitchen</td>
<td>Type E</td>
<td>Exit LED Light, Green Color, Recessed Mounting</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Kitchen</td>
<td>Type F</td>
<td>Existing fixtures- Tempered Glass- To be cleaned and polished- new gasket to be installed- To be retrofitted with LED Lamp 25W</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Kitchen</td>
<td>Type G</td>
<td>LED 2 feet (600mm) lighting Fixture – polycarbonate cover – 4000K – Waterproof- LED module with driver- 17W</td>
<td>Similar to Philips - Coreline-WT120C</td>
</tr>
<tr>
<td>8.</td>
<td>Lunch Room</td>
<td>Type H</td>
<td>Rope LED Light- To be installed under the Bar (Circuit L8)- Remote Controlled-Exact quantity to clarify during site visit</td>
<td></td>
</tr>
</tbody>
</table>

Note: All lighting fixtures shall be vetted and approved by ESD prior to installation.
Appropriate Dimmer Switch shall be used for LED fixtures
3.14 **Switches & Sockets**

Switches (10 A rated) and sockets (13 A rated) shall be to relevant British or European standards (BS 3676) and shall be of the white insulated pattern. They shall be flush mounted in suitable boxes. The number of gang and ways shall be as indicated in the drawings. The lighting switches and sockets shall be fixed at 1500mm and 900mm respectively above the finished floor level or as instructed. They shall be of reputed make. All sockets should be with neon indicator.

The contractor shall provide the following power socket as per following table:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Twin Switch Socket 13 A BS 1363</td>
</tr>
<tr>
<td>2.</td>
<td>Industrial Socket Single Phase 32A</td>
</tr>
</tbody>
</table>

All outdoor electrical fittings and accessories shall be weatherproof and vandal-proof.

3.15 **PVC Conduits/Pipes**

Wherever specified on the drawings (site plans) yellow or orange PVC pipes pressure type of the size specified shall be provided for underground cabling. These shall be laid as specified.

3.16 **Labels and Danger Notices**

All main circuits and sub-circuits shall be clearly and neatly labelled for quick circuits identification. A schematic layout for each distribution shall be displayed in each distribution Board.

Suitable warning notices in red lettering on white background shall be provided on each distribution boards. Label shall bear identifications on drawings and voltage also.

Suitable “Danger” plates shall be securely affixed on the distribution boards and mounted in prominent position. Each danger notice shall be fabricated in enamel sheet steel. Symbols shall be in red on white background and shall be to British Standard.

3.17 **Earthing System**

The contractor shall install connect the new earthing cables to the existing system as per British Standards.
4.0 Technical Specifications– HVAC

4.1 Specifications for Inline Extractor Fans

The contractor shall remove the existing extractor fan and replace it by the same air removal capabilities since the existing ducting shall be cleaned, polished and refurbished for this project. Moreover, the contractor shall install a noise reduction module on the system. The control shall provide allowance to be connected with the fire alarm system. A calibrated CO₂ sensor shall be placed in the Kitchen and shall activate an alarm for:

Either for visual indication to be placed in ESD Plant room
Or for automatic starting of the extractor fan

The contractor shall provide handheld CO₂ meter to ESD engineer and same to be quoted together with the main equipment.

Extractor fans shall be retrofitted to the following specifications:

- Inline type
- steel protected by polyester spray paint
- single phase 400V 50Hz
- Air flow rate of about 2.95 m³/sec at 500N/m² (minimum)
- motor/electrical connection protected to IP 54
- noise level shall not be greater than 70 dBA at three metres. The tenderer may be required to noise reduction module /silencer in series with the extractor fan.
- wired remote switch for fan start/speed control in the ESD Plant Room
- Soft start is recommended
- Overload protection / PTZ
- Capable operating on programmable 24 hrs / 7days basis
- Provided with all accessories/ grill/ filter/ flexible aluminium pipe/fixing metal bracket to make the installation successful.
4.2 Air conditioning System

4.2.1 Scope of Works

The scope of work to be executed under this contract shall consist of the supply, erection, installation, testing, commissioning and maintenance of the entire one ducted type air-cooled packaged systems comprising of least two compressors, condenser unit and evaporator. All required civil works are inclusive in this contract. Makes of equipment from reputable manufacturers shall be considered at approval stage.

4.2.2 Standards

All parts of the installation shall conform in all respects to British or European Standards. The B.S standards shall serve as a reference throughout to determine acceptability of materials techniques, workmanship and equipment to be used on the project. Where the installation of a particular material or equipment is described by the manufacturer, the contractor shall submit these information to the ESD Engineer before the start of the works.

Where an item or subject within the contract does not refer to a particular British Standard, the standards to which the products comply should be clearly mentioned.

4.2.3 Quality of Materials and workmanship

All parts of the plant shall be of such design, size and material as to satisfactorily function under all conditions of loading and operation. All components of the plant shall have proper factors of safety, maximum efficiency and minimum wear. Wherever applicable, the materials/components shall conform to relevant British standards.

The entire work of fabrication, assembly and installation shall conform to good engineering practice. The mechanical parts subject to wear shall be of easily replaceable type. The plant shall be installed in such a way as to cause minimum transmission of noise and vibration to the building structure.

4.2.4 Requirements

The new air-conditioner system shall be used for the cooling of the Lunch Room through a new ducting system, (see attached drawings). The air-conditioner shall be standard catalogued products from reputable manufacturers and shall be rated to operate on 3-phase, 400v and 50 Hz. The ac unit shall be located on the ground floor where the existing unit shall
be dismantle and hand over to the client and shall also be fixed using bolts and nuts on a concrete slab (minimum 4500 x 4000 mm) of 300 mm height.

The ducting system shall be sized such a way that there shall be optimum balanced flow of chilled air throughout the Lunch Room. The ducts shall be properly fixed using standard metallic support and shall be also fully insulated.

Flexible insulated aluminium conduits shall then be used to connect the ducting with new adjustable air supply outlets with appropriate dimension. The colour of the outlet shall match the new false ceiling.

The contractor shall install the new ducting system in the false ceiling which have only a clearance of 300mm from the top.

4.2.5 Capacity / Load Calculation

The equipment selected shall be able to provide a room temperature of 18°C - 22°C for an exterior temperature of 32°C and relative % humidity of 80%. If required for the application, equipment of size greater than 80kW (for reference only) shall have to be proposed and quoted for by the contractor.

The tenderer shall submit as part of the offer a complete load calculation to show the required capacity of the equipment being proposed based on the load calculation made by the tenderer; any deviation from the tender specifications shall be clearly brought out in the tender.

Non submission of the load calculation with all required details may entail elimination of the tenderer. The following must be considered in the load calculation and equipment selection:

- All sensible and latent heat gains
- Physical dimensions of the space
- Orientation of the building
- Construction material
- Number of people
- Solar gain through walls
- Solar gain through glass
- Internal gain due to appliances
- Internal gain due to lighting
- Infiltration
- Supply ducts leakage loss
- Any other necessary factors

All data / tables used shall be relevant and applicable to Mauritius and conditions prevailing at Port-Louis
4.2.6 AC Unit

- The cooling unit with at least two compressors, on Master/Slave mode.
- The units shall be tropicalised models, suitable for external use in marine atmosphere and exposed to salt sprays
- The outdoor unit shall be placed as indicated by the ESD
- The unit shall have anti-vibration mountings.
- High efficiency compressors.
- Internal thermal protection of the fan and compressor winding.
- Liquid line filter drier
- The refrigerant shall be ozone-friendly and shall be in line with the Montreal Protocol
- High and low pressure cut-outs
- Stop valves (gas and liquid) with brazed connections
- Aluminium blue fin coil of high corrosion resistance and copper tubes
- Noise level for outdoor unit shall clearly be given
- Thermal, overload and phase imbalance protection for compressor motor
- Any other items not listed above but required for the commissioning and proper functioning of the condensing unit. This shall also include all pipe works.

4.2.7 Control

The contractor shall install a new control system in the ESD new control room. The contractor shall install appropriate temperature sensors to constantly control the supply air temperature and the temperature of the Lunch Room shall be shown on a LCD screen in the ESD Control Room and the package unit.

4.2.8 Other Features

The unit shall be fully weather proof with due consideration in its manufacture for cyclonic/tropicalized weather. The refrigerant used by the unit shall be of a type that shall not cause damage to the Ozone layer of the atmosphere that is R\textsubscript{410} a.

4.2.9 Communication module

The outdoor unit shall have a communication module installed on it for diagnosis purpose. The data cable required to connect to the unit, for diagnosis, shall be submitted to ESD’s Engineer during commissioning along with the Laptop which shall have the required software and all passwords.
4.2.10 Training on Equipment and Factory inspection
The tenderer shall quote for a factory inspection of similar equipment at the manufacturer’s place on an acceptable scheduling for one Engineer and one Technician of the Energy Services Division. The training shall be on maintenance and troubleshooting for the type of Air Conditioner installed. Details of the proposed training shall be provided in the tender. The costs should include training expenses, boarding and lodging, Airfare cost (transfer from and to airport) and a daily stipend.

4.2.11 Transportation of Units
The successful tenderer shall be responsible for all accidents and damage arising out of the transfer, including any dismantling and reassembly, of the unit (which may require lifting equipment like a crane) and tenderers shall be deemed to have taken into consideration in their offers any expenditures (insurance, renting of crane, etc.) in this connection. On award of the contract the successful tenderer shall have to submit proof of this coverage.

The successful tenderer shall be responsible for making any necessary arrangements with the police regarding any special dispositions on public roads that may be required.

4.2.12 Warranty
The compressor and electronic module of the air conditioners shall be guaranteed for a period of at least 5 years and all other parts for a period of at least 1 year. This warranty period shall be effective only as from the date of successful commissioning of the air conditioners.

4.2.13 Maintenance
The tenderer shall carry out maintenance on the whole system as follows:

➢ Three Quarterly servicing (after each three months)

This shall include and not limited to the following:-

- Cleaning of air filters, drains …etc.
- Checking of Amperage, refrigerant charge, overall performance of units, insulation and vapour seal.
- Curing of excessive noises as required by client
Section V- Employer’s Requirements

- Attending leakages
- Any other item not mentioned above, but recommended by the manufacturer in the maintenance manual.

One Annual general servicing (before completion of one year warranty):

This shall include the quarterly servicing and not limited to the following:

- Cleaning of air filters, evaporators, condenser coils by pressure water jets.
- Lubricate moving parts.
- Cleaning, repainting of outdoor units, metal bases and supporting brackets (one coat of primer, one coat of undercoat and one of cold galvanised paint)
- Recharging of refrigerant where necessary.
- Check operation of all valves.
- Check operation of all measuring instruments.
- Any other item not mentioned above, but recommended by the manufacturer in the maintenance manual.

4.2.14 General Notes

1. Quotation for the above shall include supply, installation, testing and commissioning & warranty and free servicing during warranty period.

2. Original leaflet containing technical data shall be attached to the quotation as proof of compliance with specification.

3. Make and country of origin of the Air-Conditioner shall be specified.

4. Quarterly report must be submitted to the client and copy to the Engineer, Energy Services Division.

5. The successful tenderer shall submit a program of work prior to the start of works. The appointed contractor shall start work only after obtaining approval for the program of work.

6. The successful tenderer shall have to liaise with the ESD during work execution.

7. All civil works including construction of concrete bases for the outdoor units, concealing of holes, masonry works (drilling of a hole in order to pass the pipes) and/or modification to window panes/frames/metal work shall be undertaken by the successful tenderer who is expected to make a site visit and quote for these items. All opening shall be properly sealed in order to avoid leakage or loss of cool air.
8. All supports, mounting brackets, etc. (to be hot dipped galvanized) shall be supplied and installed by the successful tenderer.

9. Should the Air-Conditioner require some type of base (metal or concrete), this shall be provided by the tenderer who shall quote for this item too.

10. The drain pipes shall be leak proof and be securely fixed as and where required on the wall inside and outside the building to be connected to either the service drain of the building or any other approved methodology.

11. All surfaces, damaged during installation of air conditioners, must be made good by the successful tenderer.

12. Any support, ladder, scaffolding for installation must be provided by the successful tenderer.

13. All Electrical works inside the building shall be concealed type and outside the building in PVC conduits.

14. The tenderer shall submit as part of the contract, upon completion of work, a comprehensive operations and maintenance manual inclusive of an exploded diagram of the Air-Conditioner showing the different parts and associated part number and also any other literature supplied by the manufacturer.

15. The tenderer shall, upon completion of works, test the Air-Conditioner in the presence of an ESD Engineer. Commissioning will be carried out such that the units are operated at least for one week without any fault noticed in peak summer time.

16. The commissioning of the Air-Conditioning installation works shall deemed complete and successful only when all the above have been satisfied and completed. Two copies of test certificates shall be submitted together with the guarantee certificates.

17. Noise level of the unit and other technical data shall be clearly mentioned in the original leaflets from the manufacturer of the equipment. The tenderers must also submit details on the air-conditioners proposed and a breakdown of their prices as per the format given.

18. The contractor shall on supply of materials and equipment for use on work at site shall continue to the responsible for their safe custody till they are installed in position, tested, commissioned and handled over.

19. Tenderer must visit the site, for any particulars about the site required by him, before tendering.
20. Provision must be made by the tenderer for the supply of all test instruments, including decibel meter.
**DETAILS ON HVAC**

The tenderer shall give below details on the air conditioners quoted. Note that any quotation received with the table below being incorrectly or incompletely filled will not be considered at analysis stage.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SPECIFIED</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make of unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Model number of unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Capacity unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Country of origin of unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Warranty on compressor/electronic module</td>
<td>At least 5 years</td>
<td></td>
</tr>
<tr>
<td>6. Warranty on spare parts</td>
<td>At least 1 years</td>
<td></td>
</tr>
<tr>
<td>7. Compressor type</td>
<td>Scroll Type</td>
<td></td>
</tr>
<tr>
<td>8. Phase/Voltage/Current (Running)</td>
<td>3Ph/400V 50Hz</td>
<td></td>
</tr>
<tr>
<td>9. Noise level</td>
<td>70/75 dBA</td>
<td></td>
</tr>
<tr>
<td>10. Control</td>
<td>Wired Control System</td>
<td></td>
</tr>
</tbody>
</table>
5.0 Technical Specifications - Electrical

5.1 Fire Alarm System

The object of this section is to install a new analogue addressable Fire Alarm System for the Lunch Room. This contract shall be inclusive of the supply, installation, testing and commissioning of equipment, materials and associated items for a complete Fire Alarm System.

The Fire Alarm System shall be made up as follows:

1. A combination of optical smoke & heat detectors, and Manual Call Points to give alarms in each block.
2. The detector or manual call point from which an alarm or fault originators shall be identifiable.
3. The main control and alarm indicating panel shall be capable of indicating from which location the alarm emanates.
4. Sounders with strobe to give audible alerts.
5. Mimic Diagram
6. The main panel shall be upgradable.

This contract shall also be inclusive of the supply, installation, testing and commissioning of CO\textsubscript{2} fire extinguishers.

5.1.1 Main control and indicating panel

The main panel shall be analogue addressable system with at least 500 detectable & connecting points. The system shall also be upgradable. It shall be installed as indicated by ESD. The contractor shall make provision for a main distribution panel comprising of all required switchgears /protection modules.

5.1.2 Manual Call Points

- To be compatible to BS 5839 (or to relevant European Standards) and shall be of plastic cover. Push should be of membrane type with polycarbonate cover
- Shall have LED indication
- Recessed/surface mounting
5.1.3 Sounders with strobe

a) Shall be to IP 55

b) Sound output: About 100 dBA at 1m or 5dBA above background noise with adjustable feature

c) Two distinct sounds possible for “Alert” & “Evacuate”

5.1.4 Point and Volumetric Detectors

(a) Optical Smoke Detectors
   - Shall be to BS 5445 Part 7 or to relevant European Standards
   - Pulse light source or light scatter principles

(b) Fixed High Temperature Heat Detector
   - shall be to BS 5445 Part 8 (or to relevant European Standards)
   - operating point set at about 75° C (fixed temperature)
   - Electric thermistor detector element

5.1.5 Cabling

All fire alarm cables are to be used shall be resistant to the spread of fire and must pass both UL test 1424 and the vertical flame test UL 1581.

5.1.6 General Notes

1. One year guarantee period shall be provided.

2. Power supply shall be provided for the main panel

3. The tenderer shall undertake all civil works associated with the project and shall make good of any damages including making good of tarmac, if any.

4. Full technical literature (preferably in original) for the fire alarm system shall be attached to your offer as proof of compliance with specifications.

5.1.7 Tools and Spare
Tenderers shall submit to the ESD a complete list of tools, manufactured to European standards, as recommended by the manufacturer. The following are the minimum requirements:

(i) One complete testing kit with two bottles of aerosol for fire alarm detection system.
(ii) Two smoke detectors
(iii) One fixed temperature detector
(iv) Two manual call points
(v) Recommended tools for diagnosis and testing of the system
6.0 Technical Specifications - Elevator

6.1 Lift Installation

6.1.1 General
The Lunch Room of the New Government Centre shall be served by one good lift serving first (1st) to third (3rd) floor inclusive. The lift shall be an electric, machine-roomless type. The lift shall be operated with the least space required for its control system. A regenerative energy system is also recommended to recoup electrical energy and same to be fed back into the grid system.
The existing lift cabin and associated accessories shall be removed and discarded as per client or ESD engineer instructions.

6.1.2 Standards and workmanship
The lift shall be from reputable International supplier and manufactured and erected to European Standards as specified in BS EN 81 pt 1 and 2: 1998 “Safety rules for the construction and installation of lifts and service lifts” and published by British Standards Institution. The lift shall be constructed and erected such that the general finish is of best standards of quality and workmanship.

6.1.3 Power Supply and Protective Equipment
The Contractor shall provide all necessary cabling to connect the lift control panel to a new 4Pole 32A MCB (to be supplied by contractor) to be located in the Distribution Board in the ESD Mess Room at ground floor. Auxiliary power for car lighting, battery charger for alarm signals, shaft lighting, etc. shall be provided by the Contractor from the lift control panel.

The Contractor shall provide all protective equipment to protect the control panels (including all components therein) of the lift against all fluctuations, spikes and other disturbances as expected on the existing power supply. Protection devices shall be provided on controls.
Diagnostic testing module shall be provided in the control panel as any complementary circuit cards required for the purpose.

### 6.1.4 Controls

The passenger lift shall have a simplex full collective traffic management system with one external push button plate on each landing positioned on the right hand side of the landing doors.

### 6.1.5 Control Stations and Landing Fixtures

- **In car**

  Shall be provided in the lift car, all buttons with braille identification for the various floors with built-in indicator lights showing registered calls, one “door-open” button, one “door-close” button, one “alarm” button, car position in digital display, “voice-annunciator system” for car position and one “car-overload” display with buzzer. A key switch shall be provided in the car to enable the use of the lift for special service.

- **On top of Car**

  The following shall be included for inspection and testing on car roof: Emergency Stop switch, Inching Push Buttons (up and down), Manual Car Door opening, 13A power socket outlet with neon indicator & lighting fitting to light car top.

- **At Landings**

  Shall be provided for the lift, one control landing station located on the right hand side of the landing door with one “up” and/or one “down” call button, as appropriate. All call buttons shall have built-in lights to indicate registered calls. Shall also be provided at the landings for the lift, digital position indicators. The digital position indicators and the call buttons may be integrated in one single control station.
6.1.6 Cars
The car walls of the lift shall be in steel panels, suitably treated against corrosion, adequately reinforced and framed.
The internal finish lining shall be in stainless steel of hairline type or similar texture and which is to be finalised with the Architect prior to ordering.
The car shall have bumpers in stainless steel and fitted at suitable heights on the sides and backwall.
The floor shall be constructed as a platform supported on strong formed sheet steel frames. The platform shall be covered by granite finish of which shall be approved prior to ordering.

The roof shall incorporate suitable extractor fan units with silent operation. Lighting shall be by LED lamps with suitable diffusers or indirect.
A trap door with suitable lock shall be provided in the roof of the car for emergency situations.
A manual override control switch shall be provided on top of the lift car.

6.1.7 Car and landing Doors
The car shall be fitted with power operated, two-panel, telescopic sliding doors, giving clear opening 1200mm wide x 2000 mm high.
The car operator shall preferably be of the Variable Frequency type for a high opening/closing performance and noiseless operation.
The car door shall be equipped with a full height electronic detector for maximum safety. On interruption of the field, the door should re-open (if closing) only to a limited width and re-close immediately. In addition the door shall be fitted with a safety device such that it automatically re-opens to the full width when obstructed whilst closing.
The car door shall be cladded with stainless to the same finish as the car walls.
The landing doors shall also be cladded with stainless steel, preferably of hairline finish.

6.1.8 Architraves
Architraves shall be supplied and fixed by the Contractor. Each landing door shall have an architrave in stainless steel with the same finish as the landing doors.
6.1.9 Motor Speed controls
The drive for the lift shall be of the Variable Voltage Variable Frequency (VVVF) type to provide smooth acceleration and deceleration as well as accurate speed regulation independent of car loading.
The control system shall be contained in a cabinet with suitable ventilation louvres and shall be fully protected against rust before painting.
The lift shall operate at a contract speed of 1 m/s.

6.1.10 Application to Local Conditions

All electrical and electronic equipment shall be fully tropicalised and conditioned under the ambient conditions prevailing in Mauritius. No air conditioning shall be required by the control panel or other components.
Electrical supply shall be from the local supply authority (CEB) at 400V±6% phase to phase, 3-phase, 50 Hz. Under and over voltage as well as single phasing relay protection shall be provided by the Contractor. The Contractor shall also provide Surge Protection Equipment.

6.1.11 Stand-By Operation
The lift shall be connected to the stand-by generator and shall operate normally on interruption of the main CEB supply.

6.1.12 Emergency Lighting
One of the LED lamp provided in the car under normal service, shall be powered via a charger/battery/inverter power unit in such a way that during the interruption of the mains power supply, the lamp shall continue to operate on battery power through the inverter unit for a period of not less than two hours.

6.1.13 Emergency Signals
An alarm bell powered by a battery, which is recharged automatically, shall be provided at ground floor landing for the lift. The alarm bell shall be activated by the alarm push button in the lift car.
A repeat alarm shall be provided at the ESD Mess Room.
6.1.14 Intercom System
In addition to the alarm bells, an intercom system must be provided in the car to enable passengers in the car to communicate with people outside. The intercom system can be in the form of a built-in microphone and speaker in the car and at the ESD Mess Room or as a phone in the car, which when lifted, will ring another phone at the ESD Mess Room.

6.1.15 Lift Shaft Lighting
The Contractor shall allow for suitable lift shaft lighting within the lift shaft.
All wiring shall be laid in surface conduits suitably clipped onto the walls. Bulkheads fitted with LED lamps shall be used and they shall be installed at no more than 5 metres apart. One light point shall additionally be installed in the pit.

6.1.16 Cat Ladders
Cat ladders manufactured in galvanised steel tubes of suitable diameter and acceptable to the Architect shall be provided and installed for access to the lift pit.

6.1.17 Tests
Besides the normal Acceptance Test Certificate to be reckoned by the ESD Engineer at the time of handing over and commissioning of the lift, the supplier shall submit at his own cost an “Examination Certificate” from an independent and qualified body.

6.1.18 General Notes

- Contractors shall ensure that their equipment can be brought on site without any civil works involving modifications or damages to existing structures in the Compound.
- The Contractor shall be responsible for all accidents and damage arising out in the transfer, including assembly of the unit.
- The Contractor should submit 2 sets of as-made drawings, 2 sets of maintenance manual and two service manuals. It shall be the responsibility of the Contractor to
carry out such surveys and check measurements on site and to produce all drawings required for the project. Drawings shall cater for the lift shaft, lift pit, machine and ventilation requirements. These shall include all drawings required by the tenderer and lift manufacturer for the proper and timely execution of the project. The following shall also be provided:

(a) Detailed as-fitted drawings and detailed circuit diagrams of all power and control circuits. One complete set of negative drawings on tracing cloth or approved plastic material shall also be provided.

(b) Comprehensive maintenance manuals with diagrams and instructions sufficient to enable all or part of the lift equipment to be operated, maintained, dismantled, reassembled and adjusted.

The maintenance manual shall therefore include troubleshooting charts and a complete list of parts with part numbers, exploded diagrams, etc.

➢ One year’s running spare parts and consumables should be provided. A detailed list of the spares/consumables should be submitted together with the quotation giving a breakdown of each item, quantity and price.

Warranty period of not less than one year after commissioning of the equipment should be provided. The Supplier shall be responsible for any defect in workmanship and shall undertake to repair immediately and provide any spares within a reasonable delay at any time. After the Warranty period, the supplier shall be able to provide any spares within a reasonable delay.

All tools and accessories required for the proper running and maintenance of all lift equipment, together with one spare tin of oil or grease of each type necessary shall be supplied.

➢ 22.18.4 The successful tenderer should provide inspection of the lift at the manufacturer’s workshop for a period of one week. The inspection period
should include all necessary costs including return air ticket, transfers, board and lodging and other expenses for one ESD Engineer and one ESD Technician.

➢ 22.18.5 The successful tenderer shall state:

- When delivery of the equipment is to be effected.
- Length of period for completion of works.
- Date of handing over and commissioning of the equipment
- The guarantee Period
7.0 Commissioning

7.1 Tests on Completion

On completion of the installations, the electrical contractor shall carry out tests in the presence of ESD Engineer or his representatives and submit to the Director of ESD three signed copies of the tests certificates.

The following tests shall be carried out:

i. Insulation test
ii. Continuity tests
iii. Earth loop impedance test
iv. Earth Resistance test
v. ELCB tripping time
vi. Operation of protective devices
vii. Polarity test
viii. Testing and measuring equipment shall be of very good quality and shall be provided by the contractor in all cases.

7.2 Complete General Local Training

During the commissioning period, the successful contractor shall provide full training regarding the electrical system, fire alarm system and air conditioning system to the ESD for a minimum of 20 hours for each system.

The training program shall consist of operating, diagnosis, maintenance and repair for each system and shall be equally distributed between theory and practical. The contractor shall make provision for at least 10 persons for each program with all required tools, such as laptop, projector, notepad, hand-outs, table, chairs, etc…

7.3 Tools and Spare Parts

Tools

Tenderers shall provide to the ESD Engineer the following electrical testing tools, manufactured to European standards, as part of the contract:-
(i) 1 x Metal tool box comprising of a set full tools as follows:-

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>TOOL DESCRIPTION</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td><strong>TOOLBOX:</strong></td>
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<tr>
<td>1</td>
<td>VE LAYER TOOL-BOX _STEEL (Cantilever Type) [550mm.]</td>
<td>1</td>
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<tr>
<td>2</td>
<td>AD LOCK (40mm)</td>
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<tr>
<td><strong>FILES:</strong></td>
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<tr>
<td>3</td>
<td>CUT FLAT FILE [250mm. WITH HANDLE]</td>
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<tr>
<td>4</td>
<td>MOOTH FLAT FILE [200mm. WITH HANDLE]</td>
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<td>5</td>
<td>ASTARD FLAT FILE [300mm. WITH HANDLE]</td>
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<tr>
<td>6</td>
<td>CUT SQUARE FILE [10X10mm. WITH HANDLE]</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>LE BRUSH</td>
<td>1</td>
</tr>
<tr>
<td><strong>PUNCHES:</strong></td>
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</tr>
<tr>
<td>8</td>
<td>ENTER PUNCH</td>
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<td><strong>HAMMERS:</strong></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>ALL-PEIN HAMMER [300gm]</td>
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<td><strong>MEASURING EQUIPMENT:</strong></td>
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<tr>
<td>10</td>
<td>RERNIER [0-150mm.] Accuracy - (0.05mm.)</td>
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<tr>
<td>11</td>
<td>ENGINEERING SQUARE - STEEL [100mm.]</td>
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<td>12</td>
<td>EE RULER [300m]</td>
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<td>13</td>
<td>PE MEASURE [5 – METER]</td>
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<td>14</td>
<td>VIDER [STEEL] 150m</td>
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<td>15</td>
<td>RIT LEVEL (MAGNETIC) [200mm.]</td>
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<td><strong>PLIERS:</strong></td>
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<tr>
<td>16</td>
<td>IERS ENGINEER COMBINATION ELECTRIC(ISOLATED) [200mm.]</td>
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<tr>
<td>17</td>
<td>OUINDNOSE PLIERS (ISOLATED) [150mm.]</td>
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<tr>
<td>18</td>
<td>ATERPUMP PLIERS (ADJUSTABLE) [300mm.]</td>
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<tr>
<td>19</td>
<td>ECUTTER (ISOLATED) [200mm.]</td>
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<tr>
<td><strong>SPANNERS &amp; TOOLS:</strong></td>
<td>*</td>
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<tr>
<td>20</td>
<td>MBINATION SPANNERS (RING - FLAT) [6mm. to 24mm.]</td>
<td>1XSet</td>
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<td>21</td>
<td>ACKSAW (Square frame Professional plus) [300mm.]</td>
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<td>22</td>
<td>REW DRIVER SET (7 x Piece Set) [Insulated]</td>
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<td>23</td>
<td>ATER PUMP PLIERS [250mm]</td>
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<td>24</td>
<td>RIBER (Double ended)</td>
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<td>25</td>
<td>IFITING SPANNER [300mm]</td>
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<td>26</td>
<td>ETE GLASSES</td>
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<td>27</td>
<td>JT DRIVER (10mm.)</td>
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<td>28</td>
<td>NSNIP UNIVERSAL</td>
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<td><strong>ELECTRICAL TOOLS &amp; EQUIPMENT:</strong></td>
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<td>29</td>
<td>ALTAL MULTIMETER DMM 600V - AC/DC</td>
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<td>30</td>
<td>ESTER_EARTH-LEAKAGE</td>
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<tr>
<td>31</td>
<td>E TESTER</td>
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<tr>
<td>32</td>
<td>MPING TOOL (Up to 16mm.)</td>
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</tr>
<tr>
<td>33</td>
<td>HRE-STRIPPER</td>
<td>1</td>
</tr>
</tbody>
</table>
(ii) 1 x Energy Analyser similar to Fluke 434 Series 11 or equivalent, with all the
accessories

(iii) 1 x Refrigerant R410a Leak detector

(iv) 1 x Laptop, high performance of latest version (core I7), incorporating the
following:
   a. The A/C interface & diagnosis software
   b. The fire alarm interface & diagnosis software
   c. Energy Management Software
   d. Lift diagnosis Software (If any)
   , as administrator with all required passwords & accessories
   (cables/modem/harness etc…) for connection and the required modules.

The Laptop shall be a high performance Laptop with Core I7 4th generation, screen size of
15.6”, and a memory of 1 TB with the appropriate software for connection and diagnosis
of the system. Passwords for all levels and the software with installation CD shall also be
submitted to the ESD Engineer.

**Spare Parts**

(i) Lighting
   a. 20% of the number of each lighting fixture used in this project

(ii) Fire Alarm
   a. As per list above

(iii) One Surge Arrestor used in the project

(iv) One complete set consumable required for servicing the new Air Conditioning
    System during one year as recommended by the Manufacturer

(v) One complete set consumable required for servicing the new elevator during one
    year as recommended by the Manufacturer

**7.4 Drawings and Maintenance Program**

The tenderer shall submit upon completion of the works;

- three copies of as “fitted diagrams”
  (i) the electrical installations and protective gears
  (ii) schematic layout of circuits
  (iii) location of Distribution Boards & cable routes
➢ One detailed list of equipment used in this project with scheduled program for maintenance and servicing of same to the Director of the ESD or his representative.
## 8.0 Schedule of Materials

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Make</th>
<th>Model</th>
<th>Country of Origin</th>
</tr>
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<tr>
<td>1</td>
<td>Distribution Board</td>
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<td>Switchgear</td>
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<td>MCCB</td>
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<tr>
<td>2.2</td>
<td>MCB</td>
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<tr>
<td>2.3</td>
<td>RCBO</td>
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<tr>
<td>2.4</td>
<td>RCD</td>
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<td>Luminaires</td>
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<td>Type E</td>
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<td>Sockets</td>
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<td>4.1</td>
<td>Twin switch socket with neon indicator</td>
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<td>4.2</td>
<td>Industrial Socket Single Phase</td>
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<tr>
<td>5</td>
<td>Cables</td>
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<td>6</td>
<td>Switches</td>
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<td>7</td>
<td>Extractor fan</td>
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<td>Item No.</td>
<td>Description</td>
<td>Make</td>
<td>Model</td>
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<tr>
<td>8</td>
<td>Packaged Air Conditioning System</td>
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<tr>
<td>9</td>
<td>Fire Alarm system</td>
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<tr>
<td>9.1</td>
<td>Manual call point</td>
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<tr>
<td>9.2</td>
<td>Sounder</td>
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<tr>
<td>9.3</td>
<td>Heat Detector</td>
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<td>9.4</td>
<td>Smoke Detector</td>
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<td>9.5</td>
<td>Portable Fire Extinguisher</td>
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<td>9.6</td>
<td>Main Controller</td>
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<td>9.7</td>
<td>Repeater Panel</td>
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<td>10</td>
<td>Lift System</td>
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<tr>
<td>11</td>
<td>Any other item (please give details)</td>
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</table>
Drawings:

(A) ARCHITECTURAL

G470/01
G470/02
G470/03
G470/04
G470/05
G470/06
G470/07
G470/08
G470/09

(B) STRUCTURAL

G470/ST01

(C) ELECTRICAL

G470/ESD/01
G470/ESD/02
G470/ESD/03
G470/ESD/04
G470/ESD/05
G470/ESD/06
G470/ESD/07
G470/ESD/08
G470/ESD/09
G470/ESD/10
G470/ESD/11
G470/ESD/12
G470/ESD/13

(D) MECHANICAL

G470/M01
G470/M02

Note: for further details refer to drawing G470/02
Supplementary Information

1. The Contractor will not be allowed to work on Parliamentary Sitting days, normally on Tuesdays and sometimes on Fridays.
2. When submitting bid price, bidders should take into consideration that they may be required to work after normal hours.
## Preliminaries and General Costs

### 1. Schedule of Rates

The successful Contractor is requested to fill the SCHEDULE OF RATES to cover all items and work in this contract.

The Schedule must be agreed with the Quantity Surveyor before the Contract is signed and will form part of Contract.

The rates shown on the schedule shall be used for adjusting extras or omissions.

### 2. Ordering of Materials

The selected Contractor shall place orders at the very beginning of the contract for materials, fittings and items of equipment required for this work.

Non-availability of these items will not be considered as an excuse for delay on the works.

### 3. Discrepancies

Should the Contractor at any time discover discrepancies between drawings, scope of works or any other documents or in dimensions instructions, he shall immediately refer same to the Architect who shall decide the course to be followed. Failure on the part of the Contractor to comply with this Clause may invalidate any subsequent claim made by him.

### 4. Contractor to visit site

Contractor shall visit the site before tendering and ascertain the nature of the ground and subsoil to be excavated, the contours thereof and acquaint himself with local conditions, site conditions, site restriction, working space available, means of access, limitation and restrictions to access, risk of damage to adjacent properties, roads, etc.

The contractor will have to carry out any other survey that in his opinion is necessary for him to submit a proper proposal. This survey shall also include the services underground or above that may run on site and he shall allow in his offer for their deviation if required.

### 5. Area to be occupied by Contractor

The area of the site which may be occupied by the Contractor for his use as storage or for erection of workshops etc, shall be defined on this site by the Architect.

### 6. Access to Site and Temporary Roads

Means of access to the site shall be agreed with the Architect prior to the commencement of the work and Contractor must allow here for building any temporary access roads, gantries for the transport and lifting of all materials, plants and workmen required for the complete execution of the works, including the provision of temporary culverts, crossing bridges or other means of gaining access to the site. Upon the completion of the works the Contractor shall leave such temporary,
access roads, culverts etc. Undisturbed unless ordered otherwise by the **Architect**. No claims will be entertained for such temporary services left on site or for their removal and restoration on the site to the original condition.

7. **Maintenance of Roads**
The Contractor shall allow for maintaining and keeping public and private roads free from mud debris, etc, arising from the works throughout the duration of the contract.

8. **Plant, Tools, Scaffolding etc...**
The Contractor shall provide all necessary plants, tools scaffolding and vehicles for the efficient and expedious execution of the works and at or before completion clear same from building and site and make all good.

9. **Setting Out**
The Contractor shall set out the works in accordance with the dimensions and levels shown on the approved drawings and shall be responsible for the correctness of all dimensions and levels so set out by him. He will be required to rectify all errors arising from inaccurate setting out at his own cost and expense. In event of error or discrepancy in the dimensions or levels marked out on the drawings being discovered, such errors or discrepancies shall be reported by the Contractor to the Architect for his immediate consideration.

No work connected with such errors shall be continued by the Contractor until he has received written instructions from the Architect to adjust such discrepancies.

10. **Discharge of Workmen**
The Contractor shall only employ qualified foremen, artisans and labourers on the works. If, in the opinion of the Architect any person employed by the Contractor misconducts himself or is likely to cause or has caused strikes, quarrels or delays, or is incompetent the Contractor, when so directed by the Architect in writing shall at once remove such person from the works site.

11. **Government Ordinance and Regulations**
The Contractor must also make himself acquainted with current ordinance and any Government regulations regarding the movement housing security and control of labour camps, passes for transport etc... and allowance must be made in his Tender for compliance therewith in so far as they are practicable. It is important that the Contractor before tendering shall obtain from the relevant Authority the fullest information regarding all such regulation and/or restrictions which may affect the organisation of work, supply and control of labour, etc... and allow accordingly in his Tender. No claim for want of knowledge in this connection will be entertained.

12. **Water, Light and Power, telephone**
The Contractor shall provide at his own risk and cost the water, light and power required for use in the work and make them available free of charge to sub-contractor and others.

The Contractor will be required to arrange for the installation of a temporary connection to the main water supply and to provide himself with all necessary temporary water piping and storage tanks as required or directed, remove same and make good disturbed surfaces at completion to the
satisfaction of the Architect and pay all charges for meter hire and water consumed until the completion of works.

The Contractor shall provide and maintain a temporary telephone service on site for the full period of the contract at his own costs.

13. Watching and Lighting

The Contractor, from commencement of the contract, shall provide all watching lighting and protection of the works, materials and public through fares as may be necessary for the safety of the works, and for the protection of the public and his own employees.

14. Sheds for Storage of Materials

The Contractor shall provide and maintain to the satisfaction of the Architect and clear away on completion of the works water tight sheds for the storage and protection of all materials required for the proper execution of the work. He shall also provide storage sheds as may be required by sub contractors nominated sub-contractors and nominated suppliers and remove same when ordered.

15. Foreman’s Office

The Contractor shall provide a temporary office for the use of the foreman on the site in a position to be agreed by the Architect.

16. Sanitation for work People

Adequate sanitary accommodation for his work people etc... shall be arranged and maintained by the Contractor to a standard satisfactory to the Ministry of Health or Health and Sanitation Department of the Local Authority/District Council and/or Labour Inspector.

The Contractor shall provide satisfactory housing for the watchman and water-borne latrine, accommodation for the labour employed on site. Whether by himself or by nominated sub-contractors and/or suppliers and arrange for and pay all charges in connection therewith and allow for removing same and leaving ground clean and free from pollution to the entire satisfaction of the Architect.

17. Sign Board

The sign boards for the display of the General and sub-contractor’s names shall be approved size and design with neat and uniform lettering.

18. Testing of Material

The Architect shall make such tests of the samples of any materials as he may at his discretion deemed desirable, and the cost of such tests shall be added to the Contract Sum unless the result of such tests causes the Architect to reject any samples or materials as not being in his opinion in accordance with the specification in which case the Contractor shall pay for such tests and the cost thereof shall be recovered there from the Contractor by deduction from the Contract Sum.

19. Protective and Delivery

The Contractor shall allow for covering up and protection of work liable to damage, including temporary roofs, gutters, drains etc. If necessary, case up, cover, or in other suitable way protect all finished work liable to injury to the satisfaction of the Architect until completion of the contract. On completion the whole of the works shall be delivered up clean, complete and perfect in every respect to the satisfaction of the Architect.
20. **Employer’s facilities** The Contractor is to allow for the costs of facilities on site but not limited to the following:

(i). **Office for Supervisory Staffs** The Contractor shall provide effect and maintain where directed on the site an approved weather and sunproof temporary office for use of the Supervisory staffs floor size of 6m” x 3m and shall provide the following:

(a) A long suitable table size 80” X 30” (2440 mm X 915 mm)
(b) 8 Chairs
(c) 1 pin Board

(ii) **Survey and Testing Equipment** As may be necessary on site. **NOT APPLICABLE**

21. **Removal of Plant and Rubbish** The Contractor shall, upon completion of the works, at his own expense remove and clear away all plant, rubbish and unused materials and shall leave the whole of the site in a clean and tidy state to the satisfaction of the Architect. He shall also remove all rubbish and dirt from the site as it accumulates at the discretion of the Architect.

22. **Hoardings** The Contractor is to provide for all necessary hoardings, as appropriate, along the boundaries allocated to him in order to secure the site. **NOT APPLICABLE**

23. **Restrictions** Allow for the cost of restrictions including but not limited to the following:

(a) **Limitation of Workmen:**
The Contractor shall keep all persons including those employed by Sub-contractors under control and within the boundaries of the area allocated to him.

(b) **Limitation of construction activity**
The Contractor shall be required to limit the construction activity, Temporary buildings, storage of equipment and materials etc within the boundaries of the area allocated to him.

24. **PRELIMINARY PARTICULARS**

(i) **PUBLIC BODY**

The term “PUBLIC BODY” shall mean Ministry of Public Infrastructure Land Transport
ii) PROJECT MANAGER

The term “PROJECT MANAGER” shall mean be as designated by the Public Body

(ii) ARCHITECT

The term “ARCHITECT” shall mean

Ministry of Public Infrastructure, Land Transport (Public Infrastructure Division)

(iii) ENGINEER

The term “ENGINEER” shall mean

Ministry of Public Infrastructure, Land Transport (Public Infrastructure Division)

(iv) QUANTITY SURVEYOR

The term “QUANTITY SURVEYOR” shall mean

Ministry of Public Infrastructure, Land Transport (Public Infrastructure Division)
GUIDANCE NOTES ON PRICING OF ACTIVITY SCHEDULE

This is a lump sum tender and shall be based strictly on the information provided in the drawings, specifications, scope of works and other conditions laid in the bid document and not according to this Activity Schedule.

1. The prices in the Activity Schedule may be used if judged appropriate for the preparation of interim valuations.

2. Prices in the Activity Schedule **shall not** be used for adjusting the lump sum tender price for extra works or omissions.

3. Computation of extra works or omissions shall only be made using current market rates.

4. Any inconsistencies detected in the prices shall be resolved by the Project Manager.

5. The bidder is responsible for ensuring that works are included in his bid price, whether or not an item is given.

6. In the case of the bidder leaving unpriced any items, he will be deemed to have considered that the prices of the remaining items are sufficient to enable him to perform the services and obligations described in the items not priced without extra charge.
### A PRELIMINARIES & GENERAL COSTS

1. The Contractor is to allow for costs related to Preliminaries and General Conditions of Contract requirements including the following but not limited to setting out of works, site management, Contractor's Office, overheads, tools, plants, scaffolding, store, stacking and storage of materials, Employer's facilities, insurances, bonds, watchmen, light, electricity, signboard, protection, security of workmen, etc… and works on site, gantries, pumping and dewatering, police requirements etc.

**Note:** The tenderer is advised to visit and inspect the site for which he is tendering prior to submission of his offer as no claims will be allowed on the grounds of ignorance of the Conditions under which the works will be executed.

2. Allow for providing special care so as not to interfere unnecessarily with or so as to accommodate any services installations that may be met with.

3. Provide hoarding as per drawing G470/09

---

**To Collection**
<table>
<thead>
<tr>
<th>ITEM NO</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>B  KITCHEN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Demolition of existing partition and carting away from site</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Supply and fixing of new doors where indicated on drawings and as per specifications</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Supply and fixing of partition as per specifications and as indicated on drawings</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dismantling and carting away or hand over to client as directed existing kitchen equipment</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Remove vinyl tiles and prepare surfaces to receive heavy duty PVC flooring.</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>C  LUNCH ROOM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Supply and fixing of false ceiling as per specifications</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Painting of internal walls as per specifications</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Remove existing skirting, polish, varnish and refix</td>
<td>sum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>D  MISCELLANEOUS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any other works/items not listed above but which are deemed to be carried out as per drawings and specifications. (List below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Price Activity (Mechanical) Schedule for National Assembly

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Cold water system.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply, install, test and commission</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Pressurized cold water distribution pipework</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)</td>
<td>uPVC PN16 DN 20</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>uPVC PN16 DN 25 tapping from existing network to the nearest riser</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Pipework Accessories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)</td>
<td>Ball Valve 25 mm</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>Miniball Valve 20 mm</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>Tee Reduce 25 x 20 x 25</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>Reducer 25/20</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Wall mounted wash-down hose complete with a reel, 25m heavy duty rubber hose, isolating valve and washing gun (of European origin)</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Rod Hangers, galvanized stud, rust proof screws, bolts and nuts and others items should be stainless steel 316</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Any items not mentioned above but which are required for a complete and successful operation of whole installation. Please give a breakdown of costs of each (i) ......................................................... (ii) ......................................................... (ii) ......................................................... (iv) .........................................................</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>Hot water system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply, install, test and commission</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Hot water copper pipe to BS 1057 of assorted size</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Electric Instantaneous sink water heater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)</td>
<td>Wall mounted electric Instantaneous sink water heater of European origin with stainless steel support and bolt.</td>
<td>Unit</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To collection
(ii) uPVC connection of cold water supply to the cold water inlet of the electric water heater complete with isolating valve | Sum 1

(iii) Copper pipe connection of hot water supply from the hot water outlet of the electric water heater complete with isolating valve to the mixer tap. | Sum 1

2.3 Any items not mentioned above but which are required for a complete and successful operation of whole installation. Please give a breakdown of costs of each
(i) ..................................................
(ii) ..................................................
(iii) ..................................................
(iv) ..................................................

3.0 LPG Gas system

Design, Supply, install, test and commission | Sum

3.1 Connection of gas cylinder to a copper manifold via high pressure hose to BS 3212: 1991 Part 2 | Sum 1

3.2 Pipework

(i) Copper pipe of assorted dimension | Sum 1

3.3 Pipework Accessories

(i) Quarter turn valves | Sum 1

(ii) 1st stage regulator | Sum 1

(iii) 2nd stage regulator | Sum 1

(iv) Emergency Stop valve | Sum 1

(v) Sticker ‘GAS EMERGENCY VALVE- BREAK GLASS’ | Sum 1

3.4 Galvanized steel clamps, rod hangers, band hangers, galvanized steel studs and screws to hold copper pipe | Sum 1

To collection
### 3.5 Any items not mentioned above but which are required for a complete and successful operation of whole installation. Please give a breakdown of costs of each

(i) ..............................................
(ii) ..............................................
(iii) ............................................
(iv) ...............................................

### 4.0 Waste system

#### 4.1 Pipework

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply, install, test and commission</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>(i) uPVC 50 mm PN6 waste pipe, solvent welded</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>(ii) uPVC 50 mm SN 8/PN 10 for embedded pipework</td>
<td>Sum</td>
<td>1</td>
</tr>
</tbody>
</table>

#### 4.2 Pipework Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mm elbow with cap</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>Stainless steel Bottle trap</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>PVC saddles, g/s clamps, rod hangers, band hangers, galvanized steel studs and screws to hold waste pipe</td>
<td>Sum</td>
<td>1</td>
</tr>
</tbody>
</table>

### 5.0 Firefighting system

#### 5.1 Bottle type, dry powder 4kg fire extinguisher

- Unit 2

#### 5.1.1 Signage for dry powder

- Unit 2

#### 5.2 Fire Blanket

- Unit 2

#### 5.3 Fire suppression system

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Storage Tank complete with low ph wet agent</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>(ii) Heat detection system</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>(iii) Piping system</td>
<td>Sum</td>
<td>1</td>
</tr>
<tr>
<td>(iv) Nozzles</td>
<td>Sum</td>
<td>1</td>
</tr>
</tbody>
</table>

**To collection**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>(v)</td>
<td>Automatic release mechanism</td>
<td>1</td>
</tr>
<tr>
<td>(vi)</td>
<td>Manual release mechanism</td>
<td>1</td>
</tr>
<tr>
<td>(vii)</td>
<td>Safety mechanism for Gas shut-off</td>
<td>1</td>
</tr>
<tr>
<td>(viii)</td>
<td>Safety mechanism for Electrical shut down</td>
<td>1</td>
</tr>
<tr>
<td>(ix)</td>
<td>Any items not mentioned above but which are required for a complete and successful operation of whole installation. Please give a breakdown of costs of each (i).................................................. (ii).................................................. (iii).................................................. (iv)..................................................</td>
<td>1</td>
</tr>
<tr>
<td>(x)</td>
<td>Design, supply, install, test and commission above fire suppression systems</td>
<td>1</td>
</tr>
<tr>
<td>6.0</td>
<td>Supply of 3 sets of shop drawings for the whole system</td>
<td>1</td>
</tr>
<tr>
<td>7.0</td>
<td>Supply of 3 sets of as made drawings for the whole system</td>
<td>1</td>
</tr>
<tr>
<td>8.0</td>
<td>Supply 3 sets of O &amp; M manuals for the whole system</td>
<td>1</td>
</tr>
<tr>
<td>9.0</td>
<td>Testing and Commissioning of whole system</td>
<td>1</td>
</tr>
</tbody>
</table>

To collection
9.0 **Priced Activity Schedule (Electrical works)**

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>AMOUNT (Rs) (excl VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply, install, test and commissioning of the following distribution boards with hinge lockable door and all components (MCCB’s, MCBs, RCBOs, ELCB’s, earth bars, neutral bars, and other accessories) according to the respective electrical schematic and specifications</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>SDB 1</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>SSDB 1</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>SSDB 2</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>SSDB3</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>SSDB 4</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Energy Management System including all accessories and meters</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Supply, install, test and commissioning of all cabling works</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Supply, install, test and commissioning of all conduit works (PVC pressure pipe, PVC conduit, flameproof conduit etc…)</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Supply, install, test and commissioning of all luminaires</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Supply, install, test and commissioning of all sockets</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Supply, install, test and commissioning of all switches</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Supply, install, test and commissioning of extractor fan with all required coupling units and noise reduction unit and as per spec with CO₂ meter</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Provision to liaise with CEB and other authorities</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Supply, install, test and commissioning of new lift system, including Factory Inspection at Manufacturer place</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Removal of all existing material and accessories</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>9.2</td>
<td>Local Training to a minimum 10 persons</td>
<td>Lot</td>
<td></td>
</tr>
<tr>
<td>9.3</td>
<td>Supply of recommended spare parts for one year maintenance and servicing</td>
<td>Lot</td>
<td></td>
</tr>
</tbody>
</table>

TO COLLECTION
<table>
<thead>
<tr>
<th></th>
<th>Sub total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Supply, install, test and commissioning of new air conditioning system with new ducting system which shall be fitted in the false ceiling of 300mm clearance, including Factory Inspection at Manufacturer place</td>
</tr>
<tr>
<td>10.1</td>
<td>Removal of existing Air Conditioner unit and ducting system in the Lunch Room</td>
</tr>
<tr>
<td>10.2</td>
<td>Refurbishing, cleaning and polishing the existing ducting system in the Kitchen</td>
</tr>
<tr>
<td>10.3</td>
<td>Installation of temperature sensor and LCD (in the ESD Plant Room) for indicating the actual Temperature in the Lunch room</td>
</tr>
<tr>
<td>11</td>
<td>Removal of existing fittings, socket, Cable, ACs, ducting etc… as specified</td>
</tr>
<tr>
<td>12</td>
<td>Supply, install, test and commissioning of fire alarm system</td>
</tr>
</tbody>
</table>
| 13 | Supply of Tools and Equipment including  
   (i) One Laptop for diagnosis as per spec  
   (ii) One Energy Analyser  
   (iii) Software and licences  
   (iv) Communication Module & Cabling for interface  
   (v) Fire Alarm Testing Equipment  
   (vi) A Complete metal Tool box with all standard tools (as listed above) and those required for servicing the Lift and AC systems |
| 14 | Provision of “As made” drawings and test certificates |
| 15 | Testing and commissioning of whole system |
| 15.1 | Local training for ESD |
| 16 | Associated civil works (trenching, manholes etc…) |
| 17 | Spare Parts  
   (i) Lighting Fixtures as per list  
   (ii) HVAC units as recommended by Manufacturer  
   (iii) Fire Alarm as per List  
   (iv) Elevator as recommended by Manufacturer |
| 18 | Any other item not mentioned but necessary to complete the project (give details). |

TO COLLECTION
## COLLECTION

<table>
<thead>
<tr>
<th>Brought forward from page 105</th>
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<tbody>
<tr>
<td>106</td>
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</tbody>
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Total carried to MAIN SUMMARY ON PAGE 114
## MAIN SUMMARY

<table>
<thead>
<tr>
<th></th>
<th>Rs</th>
<th>Cs</th>
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</thead>
<tbody>
<tr>
<td><strong>1. Amount of Contractor’s price to carry out and complete the works as specified in the Instructions to bidders, Preliminaries and General Costs, Drawings, Bidding Data Sheet, Conditions of Contract as amended, Description of Works and Specifications.</strong></td>
<td></td>
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<tr>
<td><strong>2 CONTINGENCY SUM</strong></td>
<td></td>
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<tr>
<td>Allow the contingency sum of Rupees five hundred thousand <strong>only</strong> to be used at the discretion of the employer &amp; deducted in whole or part, if not required.</td>
<td>1,000,000</td>
<td></td>
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</tbody>
</table>

**SUB – TOTAL**

3 **Lump sum discount (If any)**

4 **VAT at 15%**

**AMOUNT CARRIED FORWARD TO BID SUBMISSION FORM**

Signature of Contractor: .............................................................

Name of Contractor: .............................................................

Date: .............................................................

VAT registration No: .............................................................

Business Reg No: .............................................................
PART 3 – Conditions of Contract and Contract Forms
Section VI. General Conditions of Contract

The General Conditions of Contract (GCC) applicable for this procurement is available on the web site of the Procurement Policy Office ppo.govmu.org under Ref No. W/GCC 10/5/14 dated 6 May 2014.

The GCC can be used for both admeasurement contracts and lump sum contracts.
Section VII. Particular Conditions of Contract

Except where otherwise indicated, all PCC should be filled in by the Employer prior to issuance of the Bidding Documents. Schedules and reports to be provided by the Employer should be annexed.

These clauses should be read in conjunction with the General Conditions of Contract

<table>
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<th>A. General</th>
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<tbody>
<tr>
<td>GCC 1.1 (r)</td>
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<td>GCC 1.1 (v)</td>
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<td>GCC 1.1 (y)</td>
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<tr>
<td>GCC 1.1 (aa)</td>
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<tr>
<td>GCC 1.1 (dd)</td>
</tr>
<tr>
<td>GCC 1.1 (hh)</td>
</tr>
</tbody>
</table>

| GCC 2.2 | Sectional Completions are: **Not applicable** |
| GCC 2.3(i) | The following documents also form part of the Contract: **Insurance Policies, Description of Works** |
| | The performance security and insurance policies shall be submitted before the handing over of site. |

| GCC 3.1 | The language of the contract is English |
| | The law that applies to the Contract is the law of Mauritius. |

| GCC 5.1 | The Project manager may delegate any of his duties and responsibilities. |

| GCC 8.1 | Schedule of other contractors: **Not Applicable** |

| GCC 13.1 | Except for the cover mentioned in (d)(i) hereunder, the other insurance covers shall be in the joint names of the Contractor and the Employer and the minimum insurance amounts shall be: |
| | (a) for the Works, Plant and Materials: (for the full amount of the works including removal of debris, professional fee etc...) |
(b) for loss or damage to Equipment: *for the replacement value of the equipment that the contractor intends to use on site until the taking over by the Employer.* **Evidences to be produced by Contractor.**

(c) for loss or damage to existing property (except the Works, Plant, Materials, and Equipment) in connection with Contract: *Rs 15,000,000 (fifteen million rupees) This cover shall be in the joint name of the two parties.*

(d) for personal injury or death:

(i) of the Contractor’s employees: *[The Contractor shall take an adequate insurance cover for its employees for any claim arising in the execution of the works Evidences to be produced by Contractor].*

(ii) of other people: *[This cover shall be for an adequate amount Rs 10,000,000 (Ten million rupees), for any one occurrences arising out of any one event, for Third Party extended to the Employer and its representatives].*

(e) for loss or damage to materials on-site and for which payment have been included in the Interim Payment Certificate, where applicable.

The Contractor shall choose to take the insurance covers indicated above as separate covers or a combination of the Contractor’s All Risks coupled with the Employer’s liability and First Loss Burglary, after approval of the Employer. All insurance covers shall be of nil or the minimum possible deductibles at sole expense of the contractor.

**GCC 14.1** Site Data are: **There are no Site Investigation Reports for this project. Bidders are however advised to visit the site prior to submission of bid. They should acquaint themselves with the nature of the site, extent of the work, means of access, general nature of the soil and all other matters which may influence their bid.**

No claim due to ignorance of these factors as mentioned in the preceding paragraph shall be entertained from the contractor.

**GCC 20.1** The Site Possession Date(s) shall be: **within twenty-one (21) days of the Issue of Letter of Acceptance.**

The area of the site which may be occupied by the Contractor for his use as site office or for erection of workshop etc. shall be approved by the Project Manager or his representative.

**GCC 23.1 & GCC 23.2** Appointing Authority for the Adjudicator: **No Adjudicator shall be appointed for this Contract.**
In case a dispute of any kind arises between the Employer and the Contractor in connection with, or arising out of, the contract or the execution of works or after completion of works and whether before or after repudiation or other termination of Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Employer’s Representative, the matter in dispute shall, in the first place, be referred in writing to the employer’s representative, with a copy to the other party.

The Employer and the Contractor shall make every effort to resolve the dispute amicably by direct informal negotiation. If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Public Body or the Contractor may give notice to the other party of its intention to refer the matter to:

“the competent courts of Mauritius”

Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: Not applicable.

For large contracts with domestic contractor or for contract with foreign contractor:

Any dispute or difference in respect of which a notice of intention to commence arbitration has been given shall be finally settled by arbitration in accordance with Mauritian Laws by an Arbitrator to be appointed by both parties to the dispute or in any case of disagreement, by an Arbitrator to be appointed by a judge in Chambers of Mauritius. The Arbitrator fees will be borne by the losing party. Any decision of the Arbitrator shall be final and binding to both parties”.

Not Applicable

**B. Time Control**

The Contractor shall submit for approval a Program for the Works within 21 days from the date of the Letter of Acceptance.

The period between Program updates is 15 days.

The amount to be withheld for late submission of an updated Program is 25,000

**C. Quality Control**

The Defects Liability Period is: 365 days.

Interim Payment for Materials on site is applicable.
### D. Cost Control

**GCC 41.1 (l)** The term “exceptionally adverse weather conditions” is hereby defined as any one of the following events:

1. 100 mm rainfall or above recorded in one day at the nearest rain station;
2. An official declaration of “Torrential Rain” by the Meteorological Department of Mauritius; and
3. Cyclone warning Class II or above.

**GCC 43.1** The currency of the Employer’s country is: **Mauritian Rupees.**

**GCC 44.1** The Contract is not subject to price adjustment in accordance with GCC Clause 44, and the following information regarding coefficients does not apply.

**GCC 45.1** The proportion of payments retained is: **10 % of the value of work certified up to completion of works and 5 % up to end of defects liability period.**

**GCC 46.1** The liquidated damages for the whole of the Works are: **Rs 30,000 (Rupees thirty thousand) per day.**

The maximum amount of liquidated damages for the whole of the Works is **Rs 750,000.**

**GCC 47.1** The Bonus for the whole of the Works is [insert percentage of final Contract Price] per day. The maximum amount of Bonus for the whole of the Works is [insert percentage] of the final Contract Price. **Not applicable**

**GCC 48.1** The Advance Payments shall be: **10 % maximum of the contract price less all prime cost, provisional sums and contingency sum and shall be paid to the contractor no later than twenty-eight (28) days from the date of issue of certificate.**

**GCC 49.1** The Performance Security amount is **10 % of the contract price in the form of a Bank Guarantee as per the format in Section IX. and shall be valid until**
the end of the defects liability period.

Where the Performance Bond and the insurance covers expire before the end of the defects liability period, the contractor shall renew the Insurance covers and the Bond to cover the period up to the completion of works and shall extend these to cover the maintenance period at no extra cost. The contractor shall inform the client in writing of the steps taken.

Failure on the part of the contractor to comply with the above condition may entail:

(i) Non-certification of payments
(ii) Termination of the contract
(iii) Forfeiture of the amount of Performance Bond

E. Finishing the Contract

GCC 55.1 The date by which operating and maintenance manuals are required is: the date of completion.

The date by which “as built” drawings is required is: the date of completion.

GCC 55.2 The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 58.1 is Rs 25,000.

GCC 57.2 (g) The maximum number of days is: 25 days

GCC 59.1 The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is 20%.
Section VIII - Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

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Advance Payment Security ......................................................................................................... 128
Letter of Acceptance

[on letterhead paper of the Employer]

........ [date]. ........

To: ............ [name and address of the Contractor] ...........

Subject: ............ [Notification of Award Contract No] ...........

This is to notify you that your Bid dated . . . . [insert date] . . . . for execution of the . . . . . .
.[insert name of the contract and identification number, as given in the Appendix to Bid] . . . . . .
for the Accepted Contract Amount of the equivalent of . . . . . . . . . [insert amount in numbers and words
and name of currency], as corrected and modified in accordance with the Instructions to Bidders is
hereby accepted by (insert name of Public Body).

You are requested to furnish the Performance Security within 21 days in accordance with the
General Conditions of Contract, using for that purpose of the Performance Security Form included
in Section VI (Contract Forms) of the Bidding Document.

Authorized Signature: ...................................................................................................................

Name and Title of Signatory: ........................................................................................................

Name of Agency: ..........................................................................................................................

Attachment:  Contract Agreement
Contract Agreement

THIS AGREEMENT made the . . . . day of . . . . . . , between . . . . [name of the Employer]. . . . . (hereinafter “the Employer”), of the one part, and . . . . [name of the Contractor]. . . . . (hereinafter “the Contractor”), of the other part:

WHEREAS the Employer desires that the Works known as . . . . [name of the Contract]. . . . . should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

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

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

(a) the Letter of Acceptance
(b) the Bid
(c) the Addenda Nos . . . . [insert addenda numbers if any]. . . . .
(d) the Appendix to the General Conditions of Contract
(e) the General Conditions of Contract;
(f) the Specification
(g) the Drawings; and
(h) the completed Schedules,

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Mauritius on the day, month and year indicated above.

Signed by: ________________________________     Signed by: ________________________________
for and on behalf of the Employer                     for and on behalf the Contractor

Page 124 of 187
in the presence of:
Witness, Name, Signature, Address, Date

in the presence of:
Witness, Name, Signature, Address, Date
Perfomance Security

Bank's Name and Address of Issuing Branch or Office

Beneficiary: Name and Address of Public Body

Date

PERFORMANCE GUARANTEE No.: 

We have been informed that name of the Contractor (hereinafter called "the Contractor") has entered into Contract No. reference number of the Contract dated with you, for the execution of name of Contract and brief description of Works (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance security is required.

At the request of the Contractor, we name of Bank hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of amount in figures (amount in words) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire not later than twenty-eight days from the date of issuance of the Certificate of Completion/Acceptance Certificate, calculated based on a copy of such Certificate which shall be provided to us, or on the day of , whichever occurs first. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

Seal of bank and

Signature(s)
To: ______________________________________________________ [name of Employer]
______________________________________________________ [address of Employer]

WHEREAS __________________________________________ [name and addresses of the contractor], (hereinafter called “the Contractor”), has undertaken in pursuance to Contract No. ______________________ to execute _____________________________________ [name of Contract and brief Description of Works], (hereinafter called “the Contract”);

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a local commercial bank for the sum specified therein as security for compliance with his obligation stated in Sub-Clause 49.2 of the Conditions of Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of ______________________ [amount of Guarantee] 11, we undertake to pay you, upon your first written demand and without your having to substantiate such demand any sum within the limit of ______________________ [amount of Guarantee].

We hereby waive the necessity of demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between you and the Contractor shall in anyway release us from liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee is valid until the date of the Completion Certificate.

Signature and Seal of the Guarantor _______________________________________
Name of Bank _______________________________________
Address _______________________________________
Date _______________________________________

---

11 Amount to be inserted by the Guarantor in accordance with Sub-Clause 49.2 of the General Conditions of Contract
Advance Payment Security

[Bank’s Name, and Address of Issuing Branch or Office]

Beneficiary: ...................................... [Name and Address of Employer] .........................................

Date:....................................................................................................................................................

Advance Payment Guarantee No.: ..................................................................................................

We have been informed that . . . . . . . [name of the Contractor] . . . . . . has entered into Contract No. . . . . . . . [reference number of the Contract]. . . . . . . dated . . . . . . . with you, for the execution of . . . . . . . [name of contract and brief description of Works]. . . . . . . (hereinafter called “the Contractor”).

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum . . . . . . . . . . . . . [name of the currency and amount in figures] . . . . . . . ( . . . . . . . [amount in words] . . . . . . . ) is to be made against an advance payment guarantee.

At the request of the Contractor, we . . . . . . . [name of the Bank] . . . . hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of . . . . . . . [name of the currency and amount in figures]* . . . . . . . ( . . . . . . . [amount in words] . . . . . . . ) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number . . . . . . . [Contractor’s account number] . . . . . at . . . . . . . [name and address of the Bank] . . . . .

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the . . . day of . . . . . . . , , whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

........................................................................................................ [Seal of Bank and Signature(s)] ........................

Note –
All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

1 The Guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.

2 Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months]/[one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.
STANDARD SPECIFICATIONS

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CONCRETE BLOCKLAYER

Concrete blocks

Concrete blocks for walling shall comply with B.S 2028 Type A (for load bearing walls) and of compressive strength not less than:

- Cavern of 12 blocks ..........500 lbs/sq.in
- Lowest individual block ........375 lbs/sq.in

Blocks for non load bearing walls are to be class B blocks.

Blocks shall be hollow two-hole type and shall be cured for not less than 28 days before they are used in the works. The Contractor shall supply a certificate from the supplier for each consignment of block received to the effect that the blocks meet the requirements and strength of the latest relevant B.S. Any block for which a certificate cannot be produced will be condemned and must be removed from site. All blocks supplied shall be of the same height and blocks of similar dimensions will not be accepted. Half length blocks and specials shall also be provided as specified or required to break bond.

Mortar

Mortar to be used for all Type A blockwall shall be composed of 1 part of cement to 3 parts of sand. Mortar for Type B blockwork shall be composed of one part of Portland cement, one part lime, and five parts of sand. All mortar shall be measured in specially prepared gauge boxes and thoroughly mixed dry or clean and water tight mixing platforms, with water added from a fine rose until all parts are completely incorporated and brought to a proper consistency.

All mortar must be used within thirty minutes of mixing. No partially or wholly set mortar will be allowed to be used or re-mixed.

Setting and jointing

All blocks shall be lightly wetted immediately before being bedded and jointed to minimise absorption of water from the mortar.

Blocks are to be well buttered with mortar as previously specified. The blocks shall be laid fir-faces on the outside face, in stretcher bond with 10mm, thick, full, flused up and grouted solid joints. The joints shall not vary by more than 3mm and four consecutive joints shall not exceed 38mm and four consecutive joints shall not exceed 38mm. Joints shall be raked out where surfaces of walling are to be plastered.

Laying of blocks

All walls throughout the work shall be carried up evenly in courses, no part being allowed to be carried up more than 900 mm. higher at one time than any other part and in such cases the joining shall be made in long steps so as to prevent cracks arising and all walls shall be levelled around at each floor.

All put log holes shall be carefully, properly and completely filled up on completion of walling work.
All walling shall be properly protected while mortar is setting.

Walls shall be kept thoroughly wet for at least three days or for such longer period of time as the Architect may direct. Walls exposed to the sun shall be protected with a sacking which shall be kept wet.

**Fair Face Blocks**

Where walling is to be finished fairfaced, the blocks are to be selected free from defects. Joints shall be raked out as works proceed and pointed with a neat flush joint.

The work shall be carried out regularly with all horizontal joints truly horizontal and no part shall be more than 900mm above adjacent work during construction.

**Sample Panel**

The Contractor shall include in his tender for erecting a sample panel on site of 200mm blockwork, not less than 1 square metre in area and built off a suitable concrete foundation. The sample, when approved, to form the standard for all concrete blockwork in the contract. The sample area and concrete foundation to be removed when ordered and the surface of the ground made good. Horizontal and vertical joints shall be 10mm finished thickness, and raked out 12mm deep where face of wall is to be rendered and in other cases to be left finished flush or as otherwise instructed. The joint grooves between blocks shall be completely filled with cement, lime mortar. No portion of the wall during construction to be more than 900mm above adjoining work. All work to be executed truly level, perpendicular and properly bonded together without continuous upright joints.

**Cement, sand and lime**

Cement and aggregates for this trade except where separately specified for precise concrete blocks shall be as specified for “concretor” and lime shall be dry hydrated lime to B.S 890 Class B.

**Air bricks**

Form and leave neat holes in walls and supply and build in approved louvered pattern concrete air bricks where shown. The opening shall be rendered on all sides, the bottom sloped towards external face.

**Bedding and pointing**

Bedding and pointing of timber door and window frames shall be in cement mortar. Where frames are in metal they shall be bedded and pointed in mastic. Lugs or ties shall be built into walls as described.

**Fixing blocks and leaving holes**

Provide and build into walls all necessary flying blocks and leave out or cut away as necessary holes for pipes, conduits and the like and make good after fixing by other trades and specialists.

**Build in lugs and the like**

Form or leave mortices in walls for, and build in lugs and all necessary fixing for metal windows and doors, door frames and lining, sanitary fittings, rainwater pipes, clips and bearer of various types.
When building up the walls the openings shall be made about 200mm wider than the external dimensions of the doors frames, and when the latter are placed, complete with lugs, the walling completed in concrete mix type C.

**Damp-proof course**

Where indicated on drawings provide 2-ply felt damp-proof course. Felt to be of a manufacture approved by the Architect and to be laid on a 25mm thick bed of cement mortar (1:3 mix) on walls.

The damp-proof courses to stand the full thickness of walls, partitions and beams in one width and to be overlapped 6” at all jointings and corners.

**Measurements**

The Contractor must allow in his prices for block walling for plumbing angles, all straight waste, split courses necessary for bond, bonding at angles, intersections and junctions of walling at angles, intersections and junctions of walling of different thicknesses, cutting and fitting to columns, cutting and pinning to beam, cutting and fitting around end of oils and lintols, cutting and pinning ends of structural timber.

The rates of blockwork must also include for fixing all door, window and like openings, forming reveals to same and for cutting and waste to walling in short lengths to millions and jamb of openings.

The rates of blockwork must also include for hoisting and building off beams and slab at any level, all necessary scaffolding and for work built overhead.

**Mason**

**Cement and sand**

Cement and sand for this trade shall be as specified for contractor.

**Mortar for masonry work**

Mortar for bedding and jointing of stonework shall comprise 1 part of cement to 3 parts of sand by volume.

**Stonework in walls**

All stones for use in walling shall be blue basalt stone carefully selected according to the type of walling required. Walls to be built to the thickness shown on the drawings and the stones wall be well bonded and all voids filled in solid with mortar, bond stones to be used on every 120mm vertically and 2700mm horizontally.

Mortar joints shall be raked to depth of 12mm from face of stonework ready for painting. Walls exposed to sun shall be protected with sacking which shall be kept thoroughly wet for at least three days or for such longer period of time as the Architect may direct.
Pointing

All joints shall be raked out as described in Clause 3 and pointed with cement and sand (1:3) with approved pigment added. The pointing will either be recessed, weather struck or flush.

Cleaning of stonework

The contractor shall protect the stonework from mortar droppings and wire brush and wash down all walls on completion.

Carpenter and Joinery

1. Timber generally

All timbers used in the works unless otherwise specified shall be one of the following:

(a) For constructional work keruing, gurjun, mahogany or approved local treated pine.

(b) For joinery work, mahogany, tekoma, teak

The timber shall be sound, selected, well seasoned vacuum impregnated with Tanalith Salts type C at the rate of 64 kgs per cu.m. of timber, free from all defects and shall be worked to the full sizes indicated on the drawings.

In all cases samples of the timber for use in the building shall be submitted to the Architect for approval prior to use.

2. Treatment of timber

The ends and backs of all doors, frames of all timbers built in, rosting or indirect contact with walling or concrete where not exposed to view, shall be coated with two coats of creosote, solignum or other approved preservative.

3. Replacement of defective timber

Should any of the timber warp, shrink, wind or fly to any appreciable extent within 6 months of completion of the works, the same shall be removed and new fixed in its place at the contractor’s sole expense together with all other work that may be affected.

4. Preparation of timber

The preparation of the timber shall commence simultaneously with the beginning of the work generally and shall proceed continuously until the whole of the woodwork is prepared and stacked on the site, and properly protected from the weather.

5. Constructional timber

All constructional timber shall be properly jointed and framed together with dowels, bolts or spiked as indicated on the drawings.

6. Workmanship

All carpentry shall be executed with workmanship of the best quality. All carpenter’s work shall be left with sawn surface except where specified to be wrot.
All carpenter’s work shall be accurately set out and in strict accordance with the drawings and shall be framed together and securely fixed in the best possible manner with properly maderjoints. Provide all brads, nails, screws, etc. as necessary and as directed and approved.

All timber shall be as long as possible and practicable, in order to eliminate joints.

Actual dimensions of scantlings for carpentry shall not vary from the specified dimensions by more than 3 mm in deficiency or excess.

7. Protect floors

All timber bearded floors to be protected with sawdust after laying. The sawdust to be cleared away on completion.

8. Joinery work generally

All joiner’s work generally to be cast and framed together as soon as is practicable after the commencement of the building, but shall not be wedged or glued until the building is ready for fixing same.

All work to be properly tenoned, shouldered, wedged, pinned, bradded etc. as directed by and to the satisfaction of the Architect and all properly glued up with best quality approved glue.

Oval or round brads or nails shall be used for fixing on face work, heads properly punched in and the holes filled with putty or as otherwise described.

9. Finish to

All exposed faces of woodwork shall be wrot, which shall mean bringing up the surface after planning with sand paper to a smooth satin-like finish.

10. Workmanship

All joinery work shall be executed with workmanship of the best quality in strict accordance with the detailed drawings.

All joiner’s work shall be accurately set out on boards to full size for information and guidance of artisans before commencing the respective work. All joints, ironwork and other work connected therewith fully declinated which said setting out will be required to be submitted to the Architect and approved before such respective works are commenced.

All mouldings shall be accurately and truly run and all work planned and finished to the approval of the Architect. All arises to be slightly rounded.

Should any of the joinery work shrink, warp, wind or develop other defects within six months after the completion of the works, the same will be removed and now fixed in its place, together with all other work which may be affected thereby, at the contractor’s cost and expense.
All plugs described as fixing for joinery etc. unless otherwise stated shall be formed by raw plastic Philplug screwfix or other approved patent material. No woodplugs shall be used.

Any fixed joinery which in the opinion of the Architect is liable to become bruised or damaged in any way shall be properly cased and protected by the contractor until the completion of the works.

11. Door frames

Door frames and linings shall be constructed to the sizes and details shown on the drawings. Door frames shall be fitted with three fixing irons to each side of the frame and one at the head. Frames for double doors shall have two fixing at the head. The fixing irons shall consist of 300mm long heep iron not less than 3 mm thick bent up 75mm at one end and twice screwed to the frame and the other end built into walls or cast into the lintols to a depth of 225mm (where lintols are less than 225mm deep the straps shall be cut off to the full depth of the lintol). 6mm diameter metal dowels shall be fixed to each end of the frame and let into the floor concrete to a depth of at least 50mm.

Door linings shall be screwed to wooden fixing slips let into the walls and lintols.

12. Doors

Doors shall be provided and fixed to the sizes and details shown on the drawings. Doors shall be free from all blemishes and shall be rubbed down to a satin-like finish. Frames, ledged and braced or ledged and braced doors shall be made to the sizes shown on the drawings and the nailing in construction shall be driven from the face and clenched at the back. The heads of nails shall be punched and the holes filled with petty.

The flush doors are to be equal in all respects to the samples of each type to be submitted to the Architect for approval. The coves of all doors shall be pressure bonded and stacked for inspection before the faces are fixed. The plywood facings shall be of the same species on both sides of each door unless otherwise stated.

Facings shall be free from lifting at edges, blisterings or sinking or raising of the surface due to defects in the base of materials.

13. Hardboard

Hardboard shown on drawings for linings, ceilings and joinery shall be of approved manufacture.

14. Veneered plywood

All veneered plywood or blockboard is to be counter-veneered on the reverse side. Plastic faced material shall also be counter-veneered if and where necessary.
15. **Formica**

Formica shall be as supplied by Messrs Formica Ltd. De la Rue House, 84 Regent Street, London W.1., England or similar approved, of approved colour and pattern and fixed with an approved adhesive in accordance with the manufacturer’s instructions.

16. **Ironmongery**

Butts and hinger shall be of sizes and types specified and fixed with the full number of screws and on no account shall nails be used.

All locks and ironmongery shall be fixed before the woodwork or metal work is painted. Handles shall be removed carefully stored and re-fixed after the completion of painting. Locks shall be oiled and left in perfect working order. All locks to include two keys and all keys shall be labelled with door references marked on plastic labels before handing to the Architect on completion.

17. **Plugging and screwing**

Where items are described as plugged or plugged and screwed this shall mean plugging, plugging and screwing to concrete blockwalling, concrete walling, stone walling to the approval of the Architect.

18. **Prices of timber work**

The Contractor is to include in his prices of all members for fitted ends, nitres, housings, returned ends, etc. and for short-lengths not exceeding 300mm.

The prices for all joinery items are to include for slightly rounding all arises and extra cost of labours crossgrain.

Where hardwood is described as screwed, prices are to include forpollating with a matching hardwood.

Allowance is to be made in the prices for angles, ramps, nitres, ends, etc. on timber worked on solid and shall include for all necessary non-ferrous metal screws.

The prices for all timber described as select quality are to allow for keeping clean for light coloured finishes, polishings, etc.

**Ironmonger, stitch and metalworker**

1. **Ironmongery**

All ironmongery and furniture to be approved by the Architect as to quality and type and locks to be fixed to the correct hand.

2. **Oiling of locks, etc.**

All locks, ironmongery and hinges including the moving parts of metal doors and windows to be well oiled, and all necessary adjustment made before handing over the works.
3. **Metal windows and doors**

All metal windows and doors shall be hot dipped galvanized after manufacture and shall be from a manufacturer approved by the Architect. They shall be of sizes and types shown on the drawings and shall be ordered by the Contractor and windows shall have bronze fittings with projecting hinges unless otherwise specified complete with building in lugs and glazing pins. Metal doors and windows bent or damaged during construction of the building shall be replaced at the contractor’s expense.

4. **Cyclone bolts**

All openings of metal windows shall be fitted with two cyclone bolts consisting of an extruded brass case with stamped brass sheet 115mm long complete with socket or wedge.

5. **Louvre windows**

Louvre frames to be anodized aluminium with clips of the size specified suitable for taking 6mm thick glass blades screwed to concrete jambs with 38mm screws.

Mullions to be formed by coupling 56mm x 6mm thick anodized Aluminium mullion strips bolted through to the box Mullions, and fix to lintol and cill by means of retaining brackets screwed to rawplugs in concrete with No. 4 38mm screws.

Weather strips to be in anodized aluminium and to be screwed to rawplugs in concrete at head and cill with 38mm screws.

**Workmanship**

Workmanship and materials shall be of the best quality.

Prices of all doors, windows and louvers shall also include for all necessary cutting and pinning, plugging and screwing to concrete or block openings and for making good of finishes.

**Pavior**

1. **Cement, sand and aggregate**

Cement, sand and aggregates for this trade shall be as specified for “concretor”.

Coral sand shall have three washings.

2. **Preparation of surface to receive screedings and pavings**

The surface of the concrete shall be hacked to form a good key, well washed and brushed perfectly clean with a wire brush to remove all impurities, dust etc damped and grouted with a mixture of cement and water in the form of slurry, using 2.75 kgs of cement per sq.m. of surface area, before screeds are laid.

3. **Plain screeded pavings**

Floors to have plain screeded finish shall be laid in areas not exceeding 10 sq.m at one time using teak 6mm x 19mm stop fillets. Screeds to be minimum of 19mm and to be composed of one part of cement to 3 parts
of sand. The surface to be finished to a polished surface with a steel trowel. The screeds or pavings shall be kept wet with sand, sacking or similar for at least seven days after completion.

4. Coloured screedings shall be laid in a similar manner as for plain screeding with addition of approved liquid colouring mixed in with the mortar strictly in accordance with the manufacturer’s directions and to approved shade, and kept wet for seven days after completion.

5. Expansion joints

At the entrance of each room directly under the door, fix a teak strip 6mm x 19mm deep for full width of opening to form an expansion joint between adjoining screeds.

6. Granolithic paving

Shall be laid in areas not greater than 10 sq.m. at one time using teak 6mm x 19 mm fillets. Granolithic paving shall be composed of two parts by volume of cement to five of blue basalt chippings to pass a 6mm square mesh free from dust and containing not more than 10% grit. Granolithic paving to be well watered and kept damp for seven days after laying.

7. Polishing of granolithic pavings

When laid the Granolithic paving shall be rubbed down with a carborundum stone to give polished surface.

8. Non-slip surfaces to pavings

Surfaces of internal pavings and steps where required to be made non-slippery shall be created with coarse carborundum average 11.4 kgs per m² lightly trowelled in while the paving is still green.

Surfaces of external pavings or steps where required to be made non-slippery shall have parallel lines 12mm deep and 9mm wide in the surfaces of the paving or concrete.

9. Quarry tiling

Quarry tiles shall be to the quality, sizes and colour as selected by the Architect, laid to areas indicated on the drawings. The tiles shall be set square jointed bedded and pointed in cement mortar (1 part of cement to 3 parts of sand).

Tiles shall be soaked in water 24 hours before laying and shall be thoroughly scrubbed to remove all traces of cement after laying and protected with sawdust or sacking and not used for at least 10 to 14 days.

The surface shall be polished on completion of the contact.

10. Polishing paved surfaces

Types of floors described in clauses 4 and 7 shall be cleaned on completion of the works and treated with two coats of floor polish each coat rubbed well in and polished.

11. Roof screed

Roof slabs shall be finished with a cement/sand screed 1:3 mix laid to falls and crossfalls and minimum thickness 19mm. unless specified other-
wise in bill of quantities to which shall be added an approved water-
proofing liquid used in strict accordance with the manufacturers’ written
instructions. Screeds shall be carried down rainwater outlets and finished
neatly against the downpipe. The screed shall be kept wet for at least
seven days after completion.

12. Prices of pavings and screeds tiles etc.

Prices for pavings or screeds are to include for preparation of the
concrete base, all necessary hacking, grouting with cement grout, any
extra thickness consequent upon the concrete surfaces not being finished
to true and level, laying in bays and all necessary formwork and dividing
strips and cutting the finished screed or paving for at least seven days.

Prices for tiling shall also include for all straight and raking cutting, fair
edges and fair joint, prices for tile skirtings shall further include for
angles, ends, nitres and for short lengths not exceeding 300mm.

**Plasterer and wall tiler**

**Generally**

The renderings are to be carried out so that the finished surfaces appear
without visible joints or patches. The rendering of wall surfaces, reveals
of openings and cills are to be carried out in one operation and each day’s
work stopped at a suitable point where it can be picked up again on the
following day without noticeable joints. The quality and mixing of the
materials are to be constant throughout so that there is no variation in
colour or texture. The finished coat to be brushed down and left clean to
be received decoration. In any continuous face of a wall the rendering
shall be carried out continuously and day to day breaks made to coincide
with architectural breaks in order to avoid unsightly junctions.

**Preparation of surfaces for rendering**

All faces of concrete work shall be well hacked to form a good key and
in the case of block or stone walls the joints shall be raked out. All
surfaces for rendering shall be well wetted with a hose before rendering
is applied.

**Cement**

Cement shall be as specified in “concretor”.

**Sand**

Sand shall be as specified in Fine Aggregates in “Concretor” but in
Addition shall be in accordance with B.S. 1199 and shall if CORAL
SAND have three washings in lieu of 2 for internal work.

**Lime**

Lime shall be either in the form of quick lime and obtained from an
approved source and properly stacked on site or in the form of dry
hydrated lime and conform to the requirements of B.S 890 Class B
“Quick lime or Hydrated Lime for Corse Stuff and Building Mortar”.

**Rendering**

The mix for rendering both internally and externally shall be 1 part of
Cement to 1 part of lime to 5 parts of sand plus an approved mortar plasticizer used strictly in accordance with the manufacturers’ written instructions.

Application of Rendering

All external surfaces shall be rendered in two coats unless otherwise instructed.

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The first coat of rendering shall be applied with wooden float to an even thickness of not less than 10mm and not more than 15mm. As soon as the first coat starts to set it shall be closely combed to a depth of 3mm to 6mm and kept damp for at least two days after which time the final coat shall be two days after which time the final coat shall be applied to an even thickness of not less than 6mm and not more than 25mm.

All rendered surfaces shall be kept damp for at least two days after the final coat has been applied.

Finishes to renderings

Rendered surfaces shall be finished as directed by the Architect in the following manner:

(a) **Wood floor finish:** Finish surfaces with a wood float to an even and slightly/rough textured finish.

(b) **Sponge finish:** Finish rendered surfaces with a steel trowel and while the rendering is still green dab the surfaces with a damp sponge until they present a fairly sanded textured finish.

© **Trowel finish:** Finish rendered surfaces with a steel trowel to a smooth and even surface, free from trowel marks.

Tyrolean Finish

Tyrolean rendering shall consist of a 12mm backing coat of one part of cement with 10% of lime by volume added to four parts of sand, trowelled up to a true surface left as open as possible (no combing or scratching required) followed by a tyrolean finishing coat of white cement (snowcrete or other equal, and sand of a suitable mix applied with a spraying machine and built up in three coats to a total thickness of 8mm approximately to the approval of the Architect.

Sample panel

The Contractor shall prepare samples of plastering tyrolean finish, bush-hammered finish as directed until the quality texture and finish required is obtained and approved by the Architect, after which all plastering, tyrolean and bush hammered finish expected in the work shall conform to the respective approved samples.

Arrises

Vertical and horizontal arrises shall be formed to beams, columns, openings and the like and shall be pencil rounded. Particular care shall be taken to ensure that the rendering is strong and sound at the corners.
Cracks, blisters, etc

The Contractor shall make good all cracks, blisters and other defects and leave the whole of the plaster, tyrolean, bush-hammered finish perfect at completion. When making good defects the plaster shall be cut out to a rectangular shape with edges undercut to form dove-fitted key and all finish flush with face of surrounding plaster all at the contractor’s own expense.

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Plinths

Form plinths is external rendering as shown on drawings.

Wall tiling

Wall tiling unless otherwise stated shall be of glazed earthenware tiles of The dimensions and colours specified and shall conform to B.S 1281 and shall be of approved manufacture true to shape and free from blemishes. The backing coat for wall tiling shall be in cement: sand mortar (1:2 dx) , not less than 9mm and not more than 15mm thick, the surface of which shall be closely combed while the mortar is still green and left for a period of 24 hours.

The tiles shall be soaked in water for 30 minutes and bedded with an Adhesive of the approved manufacture.

All tiles shall be laid perfectly level, the joints to run straight horizontally And vertically and to be pointed in neat cement to an approved colour.

Internal and external angles and rounded edges tiles are to be of the same manufacture, colour and thickness as the foregoing.

Prices of plasters.

Prices of plastering are to include for preparation of the surface, hacking of concrete, raking out joints of blockwork, grouting, forming temporary rules, fair edges and arrises, rounded external angles, vee joints, working to rebates making good to window or door frames, around pipes, holder-bats, sanitary fittings, narrow widths and small quantities.

Prices for rendering on walls shall also include for any extra labour involved in working to breaking columns, beams, cills, etc, all of which have been included in the general term of walls.

Prices for wall tiling shall include for all operations required in proper execution of the work out and waste and fixing as described.

Glazier

Quality of glass

All the glass to be of the best quality obtained free from all defects and Imperfections and shall be to the approval of the Architect.

Windows and doors

Glaze all windows and doors in 4.5mm thick clear sheet glass unless specified otherwise.
| **Translucent glass** | Windows requiring obscure vision shall be glazed with translucent glass of an approved texture or pattern, the thickness to be not less than that mentioned above unless specified otherwise. |
| **Putty** | Putty for glazing to wood shall be made of pure whiting and raw linseed oil and to be used fresh. Putty for glazing to metal shall be steel sash putty of approved manufacture. |

All putty shall be delivered on site in the original manufacturer’s sealed cans or drums and used direct therefrom, with the addition only of pure linseed oil if necessary. No mineral or other cils shall be used in the putties except genuine linseed oil.

The rebates of metal window shall be painted one coat before putting.

**Glazing**

All glass to be cut accurately in one piece, to fit easily into their rebates and to be well putted, back putted and secured with springs in the case of fixing to wood or with metal clips in the case of metal. Care must be taken to ensure that the putty does not show beyond the sight lines of panes and that the putty is neatly cut off internally and neatly splayed off externally all mitres and angles left clear and sharp.

**Glass blades for louvre window**

Blades for louvre windows shall be 6mm thick glass of selected glazing quality Grade ‘A’ to B.S 952 and of approved manufacture.

The two long edges of the blades shall be flat smooth polished with no sharp arises and the two others clean cut. The contractor shall, when requested to do so, produce certificates of proof of manufacture and quality of the glass blades he proposes to use.

**Glazing work at completion**

All glass broken, cracked or scratched during the progress of the works to be reinstated at the sole cost of the contractor and all glazing to be left clean and perfect at the completion of the contract.

**Painter & Decorator**

**Generally**

All work shall be carried out in strict accordance with schedule of colours to be obtained from the Architect.

Samples of colours if requested by the Architect shall be painted on the walls 1.00m x 1.00m square and approval obtained from the Architect before proceeding with the work.

**Materials, paint, Varnishes, etc**

All oil paints, emulsion paints, varnish and other materials shall be of an approved manufacture and shall be used strictly in accordance with the manufacturers’ printed instructions, the contractor will only be allowed to
use materials which are brought to the site in sealed cans not exceeding one gallon capacity, bearing the name of the manufacturer and properly labelled as to quality. Exterior quality paints only shall be used, both internally and externally. All cans of paint must be kept well stirred before and during use. The only addition to the paint which will be allowed shall be approved pure turpentine and this shall be added only in accordance with the Architect’s instructions. All coats of paint applied over each other shall be from the same manufacture and the type recommended by the manufacturers.

Well before commencing the painting work the contractor shall submit to the Architect for approval a list of all the brands of paint and finishings including the necessary primers and undercoats he intends to use and immediately upon being so approved orders shall be placed and total requirements obtained for the works.

Once approved no other brand of materials shall be used without the express permission of the Architect in writing.

**Preparation of Surfaces**

All surfaces to be painted shall be thoroughly cleaned down and surfaces of wood to be sand-papered and to be twice knotted and stopped before applying the priming coat which shall be regarded as additional to the undercoat. All surfaces of ironwork to be thoroughly cleaned of all scale, and every particle of rust, dirt or grease removed by scrapers’ and wire brushes, or other approved method. Galvanized, sheradised or zinc sprayed metal to be painted shall be treated with mordant solution. Copper pipes specified to be painted shall be rubbed down with coarse emery, cleaned with a solution of one part acetone to two parts of benzel and left to dry.

**Wood Preservative**

Treat all timber built in or in contact with walling and concrete with 2 coats of approved type of wood preservative.

**Galvanised metal Surfaces**

Clean down, treat with degreasing solution, prime with yellow chromate or other approved primer, and paint two undercoats and one gloss finishing coat oil paint.

**Ironwork**

Clean down, removing every trace of rust and paint 1 coat of red lead primer, 2 coats of undercoat and one gloss finishing coat.

**Rendered surfaces**

Brush down to remove dirt and dust, prime with alkali resistant primer as specified by the suppliers of the emulsion paint to be used and paint three coats of approved plastic emulsion paint (external quality) both internally and externally strictly in accordance with manufacturers’ instructions. The walls are not to be pumiced down.

**Cleaning on**

All floors to be twice washed, all marks of paint to be sponged off,
windows cleaned, the work generally to be touched up after all the other trades are finished and the whole of the building left clean and perfect on completion to the satisfaction of the Architect.

**Laboratory furniture and workbench**

All laboratory furniture are to be finished with one coat polyurethane lacquer of approved manufacturer. The first coat is to be gloss lacquer thinned with 10% white spirit and applied to all surfaces including the back of fittings, inside of drawers, and doors, etc. All exposed surfaces are to be finished with a further cost of semi-gloss lacquer. Hardwood bench tops are to be finished with two coats or linseed oil.

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**Plumber**

**General**

All materials and workmanship shall comply with the latest editions of The British Standards’s Specification, Codes of Practice, By Laws and Regulations of all Statutory Authorities concerned.

The Contractor shall include for producing all working drawings, details, builder’s work and holes drawings necessary to carry out the work and as required by the Architect. The drawings shall be based upon the Architects diagrammatic drawings and shall be submitted, in duplicate progressively at least two months prior to the programmed commencement of work coordination and approval of the Architect. All alterations to drawings, whether due to co-ordinations or otherwise, shall be carried out by the contractor. The contractor shall provide the Architect with four copies of each approved drawings in addition to those required for his own use.

At completions of the contract, the Contractor shall provide the Architect With one complete set of negatives indicating the “As installed” installation and three prints of the said drawings complete with all operational and maintenance instructions, value charts, and test certificates. These drawings shall be provided to the Architect at practical completion of the works, failing which the Architect reserves the right to withhold an appropriate portion of the first retention money.

All work shall be tested in sections as required and before being covered up, for the Architect and statutory authorities. Before any test is carried out, a minimum of seven days notice shall be given to the Architect.

Where access is indicated to soil, waste and rainwater pipe fittings, the Contractor shall ensure that all access doors and rodding eyes are so positioned as to be accessible. Before testing, all access doors shall be removed, inspected, the washer greased and then reassembled by the Contractor.

**Lead in flats flashings, aprons etc.**

The lead used shall be best milled sheet lead of approved manufacture. No solder to be used in laying of lead except where quite unavoidable
and no continuous strip of lead to be more than 2.00m long. Overlaps to be not less than 75mm. Lead flashings, aprons, soakers and other lead work where required to be fixed shall be secured with copper nails. Leadwork shall comply with the following weights.

<table>
<thead>
<tr>
<th>Material</th>
<th>Per sq.ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead gutters &amp; flats</td>
<td>29.3 kgs</td>
</tr>
<tr>
<td>Flashings and aprons</td>
<td>24.4 kgs</td>
</tr>
<tr>
<td>Soakers</td>
<td>19.5 kgs</td>
</tr>
</tbody>
</table>

Soil ventilating pipes

Soil ventilating pipes shall be not less than 63mm interval diameter cast iron pipes conforming to B.S.S and fitted with the necessary junctions and bends. All joints shall be made with a gasket of tarred hemp and caulked with a mixture of neat cement just moist. The pipes shall be secured to the wall with approved holderbats which shall be securely fixed to the wall with rawlbolts.

Ventilating pipes shall be carried at least 900mm above eaves level and shall be fitted with approved coated wire balloon.

Rising Main

The Contractor shall include for all charges for tapping and connection to public water main, including all necessary excavations and reinstatement of public roads.

Galvanized pipes and fittings for water services

All internal and external water services, fittings, wastes, overflows and the like shall be in screwed and socketted galvanized wrought iron or steel tubes and tubulars, the former complying with BS 788 for water (medium) and the latter with BS 1387 for B class. Pipes above ground level shall be fixed to walls with approved type galvanized malleable iron built in clips, brackets, holderbats or pipe clips, the spacing of which shall not exceed 900mm.

The jointing of galvanized piping and fittings shall be made with proprietary brands of jointing paste or compound complying with BS 1260 and if these are not obtainable by a method to be approved by the Architect.

Unless otherwise specified or detailed on drawings the internal diameter of service pipes shall comply with the following:

<table>
<thead>
<tr>
<th>Diameter of supply or feed pipe</th>
<th>No. of tappings shall not exceed</th>
</tr>
</thead>
<tbody>
<tr>
<td>13mm</td>
<td>2-13mm</td>
</tr>
<tr>
<td>19mm</td>
<td>4-13mm</td>
</tr>
<tr>
<td>25mm</td>
<td>-13mm or 2 – 19mm</td>
</tr>
<tr>
<td>31mm</td>
<td>10-13 mm or 2 – 25mm</td>
</tr>
</tbody>
</table>
38mm

16-13mm or 6 – 19mm

3 – 25mm or 2 – 31mm

**Water taps**

All bib, pillar, globe and stop taps shall be of the screw down pattern and comply in every respect with BS 1010. The size specified or shown on the drawing shall mean the maximum bore of the seating.

**Stopcocks and boxes**

Brass stopcocks shall be provided at the immediate entry of the water services into the building and at the other points as indicated on the drawings and shall be of a pattern approved by the Architect.

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Stopcock boxes where required externally shall be constructed of 150mm earthenware pipe out to the required length and fixed vertically over the stopcock on two concrete blocks and the earth well consolidated round the sides. Top of pipe to be fitted with 225mm x 25mm, thick precast concrete cover reinforced with 13mm chicken wirenetting and fitted with a lifting ring.

**Testing of water services**

The whole of the water services laid or fixed by the contractor shall be tested at the contractor’s expense in the presence of the Architect and shall comply with his requirements and any defects made good to his satisfaction. In the absence of instructions regarding the test it shall be an air pump and pressure gauge test the pressure applied at 35 to 53 grms per cm² for one hour at the end of which period the loss in pressure shall not be greater than 1/50th of lb. per 225 mm².

**Waste pipes**

Waste from sinks and shower to be in 38mm bore pipe and from lavatory basins to be 31mm. All wastes to be carried through external walls to discharge over gulley gratings. All wastes pipes shall be at each change of direction of pipe be fitted with a tee, one end with screwed plug for cleaning purposes. The external gulley to be connected to the nearest manhole. Wastes from urinals to be taken in 50mm diameter cast iron pipe with trap at urinal end and connected by 50mm pipe externally to the nearest manhole. **All laid to fall.**

**Overflow pipes**

Overflow pipes are to be fitted to all w.c distant tanks and baths and in each case the overflow pipe shall be 6mm longer in diameter than the water supply to the unit. Overflow pipes to w.c cisterns shall be taken through an external wall to finish 150mm beyond the face of the wall.

**Supply of sanitary ware**

Baths, w.cs, basins, sinks and other sanitary units shall be of approved manufacture and shall comply with the relevant B.S.S.
They shall be of the type and designs shown on the drawings or to the Architect’s instructions. The whole of the units shall be properly fixed and connected to the water service complete with wastes and overflows as described.

**Rainwater pipes**
Rainwater pipes shall be approved rigid P.V.C rainwater unless otherwise described. Pipes shall be properly fixed to walls with approved clips at distance to be directed by the Architect.

**Drain pipes for soil drainage**
All pipes for soil drainage which include the conveyance of discharges from wcs, basins, sinks, drains, baths and showers shall salt-glazed earthenware pipes, bends, junctions and tapers complying in all respects with B.S no. 63 for “British Standard - 19 –
Pipes” and must be stencilled with the registered mark of the B.S.I. Other fittings shall comply with the dimensions laid down in B.S 539. If the above type of pipe is unobtainable then best Commercial Quality may be used on conditions prior approval of the Architect is obtained.

**Drain pipes for water drainage**
Pipes conveying storm or surface water shall be second quality distinguished by a black band.

**Laying of drain pipes**
The pipes to be laid in straight runs to even and regular falls, and put together with great care, the spigot of one pipe shall have one lap of tarred gaskin wrapped round it and then placed into the socket of the pipe previously laid. After the adjustment the gaskin shall be caulked lightly home but not so as to occupy more than one quarter of the socket depth. The socket shall then be completely filled with cement mortar (1:1) and a fillet shall be formed round the joint, with a trowel forming an angle of 45 degrees with the barrel of the pipe. The joint inside to be struck with a scraper, so as to give a perfectly clear and unobstructed water way.

**Fall in drains**
All pipes except where otherwise shown shall be 125mm internal diameter laid to a fall of 1:50.

**Concrete bed to drains**
Concrete (1:3:6) shall be laid 150mm thick to form bed for drains where the soil is found to be soft. After the pipes have been tested, it shall be haunched up on both sides to a height of 3/4th of the internal diameter of the pipe.

**Concrete cover to drains**
All pipes passing under buildings or under roadways shall, in addition to a 150mm concrete bed under, be completely surrounded in concrete of the same thickness of (1:3:6 mix).

**Gully traps**
Provide trapped gullies, complete with gratings in positions shown on drawings, set on concrete and surrounded in concrete,
and jointed to drain as described.

**Manholes**

Manholes are to be constructed in the positions shown on the drawings. The internal dimensions of the manholes shall vary according to their depth and shall be as follows:

<table>
<thead>
<tr>
<th>Depth of manhole from top of invert to finished ground level</th>
<th>Internal dimensions of manhole shall not be less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 600mm</td>
<td>600 x 450mm</td>
</tr>
<tr>
<td>Up to 900 mm</td>
<td>750 x 600mm</td>
</tr>
<tr>
<td>Up to 1200 mm</td>
<td>825 x 675mm</td>
</tr>
<tr>
<td>Up to 1500mm</td>
<td>900 x 750mm</td>
</tr>
</tbody>
</table>

Exceeding 150mm in depth the Contractor shall apply to the Architect for details.

Manholes shall be constructed in concrete (1:3:6) cast in situ hacked for key and finished above the benching with 6mm thick rendering of cement and sand mixed in the proportions of 1 to 2. The thickness of the concrete walls shall vary according to the depth and shall be as follows:

| Depth of manhole from top of invert to finished manhole walls shall not be less than |
|---------------------------------------|---------------------------------------|
| Up to 600mm deep                     | 100mm thick                           |
| Exceeding 600mm but not exceeding 1500mm | 150mm thick                           |

Exceeding 1500mm in depth the Contractor shall apply to the Architect for details.

The floor of manholes shall be 150mm thick and the channels and benching shall be formed above the level of the floor in fine concrete (1:2:4) average 225mm thick with a polished fall and carried up 450mm above invert level and channels. The cement for benching to be sulphate resisting cement.

Step irons shall comply with B.S 1247 and shall be placed at intervals of 450mm vertically with 300mm offset between alternate steps.

Manhole covers other than those in roadways shall be 600 x 450mm cast iron medium weight with frame set flush in 125mm concrete cover slab Mix C, the building shall be bedded in grease and shall be of an approved heavy iron pattern and the contractor shall apply to the Architect for details including the construction of the manhole.

**Soakaways**

Construct soakaways not less than 6m away from the building in position approved by the Architect. Water from rainwater pipes to be first taken into a trapped gulley below rainwater pipes to be first taken into a trapped gulley below rainwater pipes and thence by 100mm diameter pipe to soakaway. The soakaway to be 900mm x 900mm x 1500mm deep filled with stones and finished
with a 300mm layer of 38mm macadam.

Cast concrete kerb around gulley and soakaway in mix B concrete 100mm thick and 225mm deep to project 125mm above ground level. Render kerbs with a 1:3 cement and sand and finish with slightly rounded edges.

**Septic tank**

Septic tanks shall be constructed in position shown on the site plan not less than 15m away from the building, in accordance with detail drawing.

**Interception chamber**

Interception chamber shall be constructed as described for manholes with an approved saltglazed eathernware intercepting trap with rodding arm fitted with standard jointed stopper set and surrounded in concrete mix C and jointed to drain.

**Fresh air inlet**

Build into the side of the interception chamber a 100mm diameter cast iron pipe with bend to terminate not less than 750mm above ground level jointed to an approved 100mm galvanized fresh air inlet valve with cast brass flap and hinged mica flap.

**Drain testing**

All drainage runs shall be tested before tracks are filled up and afterwards when the drainage system is complete in the presence of the Architect. The contractor shall supply all necessary equipment and labour for carrying out the tests. The air test shall be carried out by plugging all openings with standard air test apparatus to one end. The air pressure in pipes to be built up by means of a suitable pump until a head of 100mm is reached and the test continued until approved by the Architect. The maximum loss allowed shall be a fall of 25mm over a period of 5 minutes after pumping has ceased. If the fall exceeds 25mm a smoke test shall be immediately carried out to locate defects and all such defects shall be made good and further tests carried out at no extra cost to the Employer.

**ROADS AND FOOTPATHS**

**Site clearance**

All roots, tree stumps, rocks and similar obstructions in the line of The excavation of the road or footpath shall be removed from the site having due regard to Clause No. 1 of the Excavator section of this specification.

**Macadam finished roads**

Excavate to a depth of 225mm below the required finished level of the road, and to the full width directed. All excavated materials shall be spread and levelled on the site or removed from the site as directed by the Architect.
Tarmacadam roads, Drives playground, etc.

Remove top soil to a minimum depth of 225mm and compact formation level by a 8-10 ton roller. Where formation is composed of clayed soil (to be decided by the Architect) apply a layer of coral sand 38mm thick and compact again.

**Operation 1**

Hardcore filling consisting of angular shapes blue basalt spalls 150mm x 100mm x 75mm type B to be placed on the compacted surface after operation 1, blinde by 63mm aggregate and compacted with the 8-10 ton roller by successive passes until a well interlocked mass is obtained.

**Operation 2**

Spread 25mm aggregate on the compacted hardcore filling after operation 2 at the rate of 16-18 sq. metre of surface per cu.metre, blinde with 19mm aggregate at the rate of 40-50 sq.metre of surface per cu.metre and compacted with the 8-10 ton roller until no movement of the 19mm aggregate is possible.

**Operation 4**

Spray bitumen of 6/70 penetration at a temperature of 300°F (using a bitumen sprayer) at the rate of 2 sq.metre per gallon, followed immediately by 9mm aggregate at the rate of 150 sq. metre of surface per cu.metre and rock sand at the rate of 300 sq. metre of surface per cu. metre compact with a 8-10 ton roller after the surface has been smoothed up by hand and brass brooms.

**NOTE:** The surface to be finished to the level decided by the Architect on site.

**Kerbing in stone**

Edges of all roads requiring stone edging; the level kerbing shall be made of selected rocks with level and square exposed edges of full thickness of the hardcore and finished flush with the road surface.

**Kerbing in concrete**

To edges of all playground and paved areas except where otherwise indicated provide 300mm wide and 225mm deep concrete curbs, cast in situ to full widths and depths of 1:2:4 concrete, with smooth trowel finish to exposed edges and finished flush with and to follow falls of paved areas. At inter-sections of curbs and at intervals of 30 metres in straight run provide 13mm wide butt jointed expansion rail to back of kerbs to within 50mm of top of curb and where filled filling to be banked at a slope not exceeding 1 in 3.

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**EXCAVATION**

2.1 **Inspection of Site**

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The Contractor is deemed to have visited the Site and to have ascertained the nature of the material to be excavated.

2.2 **Dealing with water**

The contractor’s attention is drawn to the depths below ground level of the foundations and the consequent possibility of having to deal with water. Unless otherwise specified the contractor will be required by pumping or other means to keep the excavations dry during construction.

**Shoring of existing structure**

The contractor’s attention is drawn to the requirements for shoring parts of the structure of the existing building during construction and the consequent need to carry out the excavation in stages. He is not allowed to excavate within the proximity of the existing structure without the drawings and/or instructions by the Engineer to do so.

2.3 **Excavation Dimensions:**

The excavation are to be executed to the widths and depths shown on the Drawings or to greater depths if instructed by the Engineer to obtain satisfactory foundations.

If the contractor excavates to any widths or depths greater than those shown on the Drawings, or as instructed by the Engineer he shall at his own expense fill in such widths or depths beyond that instructed or shown with concrete Grade “D” to the satisfaction of the Engineer.

2.4 **Rock**

“Rock” means any hard material, which in the opinion of the Engineer can be removed only by use of compressors or by wedging and the Engineer’s opinion shall be final. Decomposed rock, tuff or other material which can be removed by pick, traxcavator or other mechanical plant will not be classed as rock. All material classified as rock may, if approved by the Engineer, be used as hardcore filling and the measured quantities of imported filling will be adjusted accordingly. All rock so used must be broken to the required size as hereafter described before being used.

2.5 **Blasting:**

No blasting will be permitted.

2.6 **Bottom of excavations to receive foundations:**

The Contractor shall report to the engineer when secure bottoms to the excavations have been obtained. Any concrete or other work executed before the excavations have been inspected and approved, shall if so directed, be removed and new work substituted after the excavations have been approved, all at the Contractor’s expense. The surface of the bottoms to excavations shall be levelled or graded to falls as required, with 50mm layer of concrete Grade “D” blinding (maximum 20mm gauge aggregate) and finished to a smooth surface with a wood float.
2.7 **Hardcore filling:**

Hardcore for filling under float, etc, shall be good hard stone ballast to the approval of the Engineer, broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being completed whichever is the lesser and graded so that it can be easily and thoroughly compacted by rolling.

The filling is to be laid in layers each of a consolidated thickness not exceeding 225mm and well watered and rolled with a vibrating roller (minimum 14 tons) or a ten ton roller. Where rollings impossible, compaction shall be by hard or mechanical tampers. The top surface of the hardcore shall be levelled or graded to falls as required and blinded with similar material broken to 25mm gauge and surfaced with a 25mm layer of stone dust, well watered and rolled to receive concrete as described.

2.8 **Materials found in excavations**

No material found in the excavation is to be used in the works without the written permission of the Engineer.
After completion of the installations, the operation of the plant and equipment shall be subject to the approval of the Engineer.

Where these Preambles, the Bills of Quantities or the Drawings require specific procedures to be followed, such requirements are not to be construed as prohibiting the use by the Contractor of alternative procedures if it can be demonstrated to the satisfaction of Engineer, that equal results will be obtained by the use of such alternatives.

Approval of plant and equipment or their operation, or of any construction procedure, shall not operate to waive or modify any provisions or requirements contained in these preambles governing the quality of the materials or of the finished work.

3.5 **Levels and Foundations:**

The foundations of the works shall be carried down to depths as may be directed by the Engineer and they must be cut as nearly to the size of the concrete as possible and the vacant spaces between the concrete and the solid ground, excepting where otherwise shown, must be carefully filled in as instructed by the Engineer.

All temporary timbering shall be removed but should any timber be left in or should any other work be done beyond that specified, it will be at the Contractor’s own cost.

3.6 **Tolerances:**

On all setting out dimensions of 7.5m and over a maximum non-cumulative tolerance of plus or 6mm will be allowed, and for those under 6m the allowable maximum non-cumulative tolerance will be plus or minus 3mm. On the cross sectional dimensions of structural members, unless otherwise required by the Drawings, a maximum tolerance of plus or minus 3mm will be permitted.

The top surface of concrete floor slabs and beams shall be within 6mm of the normal level and line shown on the Drawings. Walls and columns shall be truly plumb and non-cumulative tolerance of 3mm in each storey and not more than 12mm out of plumb in their full height will be permitted. The contractor shall be responsible for the cost of all corrective measures required by the Engineer to rectify work which is not constructed within the tolerances set out above.

3.7 **Materials generally:**

All materials which have been damaged, contaminated or have deteriorated or do not comply in any way with the requirements of these Preambles shall be rejected and shall be removed immediately from the site at the Contractor’s own expense.

No materials shall be stored or stacked on suspended floors without the Engineer’s prior approval.

3.8 **Samples and Testing:**

Every facility shall be provided to enable the Engineer to obtain samples and carry out tests on the materials and construction. If these tests show that any of the materials or construction do not comply
with the requirements of these Preambles, the Contractor will be responsible for the costs of the tests and the replacement of defective materials and/or construction.

3.9 **Cement:**

Cement unless otherwise specified shall be Portland Cement of a Brand approved by the Engineer and shall comply with the requirements of B.S. 12, and a manufacturer’s certificate of Test in accordance with B.S. 12 shall be supplied for each consignment delivered to the site.

Cement may be delivered to the site either in bags or in bulk.

If delivered in bags each bag shall be properly sealed and marked with the manufacturer’s name and shall be stored in a weatherproof shed of adequate dimensions with a raised floor. Each consignment shall be kept separate and marked so that it may be used in the sequence in which it is received. Any bag found to contain cement which has set or partly set shall be completely discarded and not used in the works. Bags shall not be stacked more than 1.5m in height.

If delivered in bulk the cement shall be stored in a waterproof site either provided by the cement supplier or by the contractor but in either case the site shall be to the approval of the Engineer.

3.10 **Aggregates:**

Aggregates shall conform with the requirements of B.S. 882 and the sources and types of all aggregates are to be approved in all respects by the Engineer before work commences.

The grading of aggregates shall be one within the limits set out in B.S. 882 and as later specified and the grading, once approved, shall be adhered to throughout the works and not varied without the approval of the Engineer. Fine aggregate shall be clean, crushed rock sand and coral sand, of hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. Coral sand shall be washed in running water to the satisfaction of the Engineer. It shall be graded within the limits of zone 1 or 2 of table 2 of B.S 882.

Coarse aggregate for concrete Grade ‘A’, ‘B’ and ‘C’ shall be crushed blue basalt stones to the approval of the Engineer. It shall be hard, clean and roughly cubical in shape, non porous, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable, thin, elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. 882 for its respective nominal size. If in the opinion of the Engineer the aggregate meets with the above requirements but is dirty or adulterated in any manner it shall be screened and/or washed with clean water, if he so instructs at the Contractor’s expense.

Aggregates shall be delivered to the site in their prescribed sizes or gradings and shall be stock-piled separately on paved areas or boarded platforms in separate units to avoid intermixing, excessive segregation and contamination with other materials. On no account shall aggregates be stock-piled on the ground. Fine aggregates shall be allowed to drain until it has reached a uniform moisture content before it is used.
3.11 **Water**

The water used for mixing concrete shall be from an approved source, clean, fresh and free from harmful matter.

3.12 **Admixtures:**

No admixtures except the ones specified for waterproof concrete shall be allowed. The Contractor may use an approved “plasticizer” which will be added to the mixing water in the proportion recommended by the manufacturer and strictly in accordance with their written instructions, to achieve better workability. No additional cost will be paid for the use of the plasticiser.

### CONCRETE STRENGTHS

4.1 **Grades of Concrete:**

Grades ‘A’, ‘B’ and ‘C’ concrete shall have the following minimum strengths as given by Works Cube Test:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Min. crushing strength at 7 days (N/mm²)</th>
<th>Minimum crushing strength at 28 days (N/mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>B</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>C</td>
<td>14</td>
<td>20</td>
</tr>
</tbody>
</table>

Grade ‘D’ and ‘E’ concrete shall be of the following nominal mixes and may be moistened either by volume or by weight. No cube tests will be required for Grades ‘D’ and ‘E’ concrete. These grades will be used for un reinforced concrete, with a minimum slump of 50mm.

<table>
<thead>
<tr>
<th>Grade</th>
<th>D</th>
<th>E (with plums not exceeding 20% by total volume of concrete)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal mix by</td>
<td>1.10</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Max. gauge of coarse aggregate: 40mm* 40mm* 40mm* (or 20mm for blinding concrete where described).

4.2 **Maturing of Concrete Materials**

**Cement**

The quantity of cement shall be measured by weight. Where delivered in bags, each batch of concrete is to use one or more whole bags of cement.
Aggregate

(i) For Grades ‘A’, ‘B’ and ‘C’ concrete, aggregates may be measured by weight in weigh batching machine as described hereafter.

(ii) For Grades ‘D’ and ‘E’ concrete, aggregates shall be measured by weight or by volume. Where measured by volume, approved gauge boxes of such a size as will give the correct proportions shall be used.

4.3 Weigh batching machine

Weigh batching machine shall be of an approved type and shall be properly maintained and checked for accuracy at weekly intervals.

4.4 Concrete Mixes ‘A’, ‘B’ and ‘C’

As specified above.

The Contractor shall have two alternatives to achieve the specified concrete strengths.

4.5 Alternative 1 Design Mix

Contractor can use minimum amount of cement by weight per cubic metre of finished concrete as set out below, if he provides strict with CP 110 Clause 6.5. Requirements for design mixer.

Target mean strength. Evidence of suitability of proper mix proportions.

Trial mixes.

4.5.4 Additional Trial Mixes

The copies of this circular is available from the Engineer’s office on request by the contractor.

The minimum cement content by weight shall be

Minimum cement content per cubic metre of finished concrete

<table>
<thead>
<tr>
<th></th>
<th>Mix A</th>
<th>Mix B</th>
<th>Mix C</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>1:13/16:2</td>
<td>1:1 ¾:3</td>
<td>1:2 ½:4</td>
</tr>
<tr>
<td>kg/300 mm³</td>
<td>450 kg</td>
<td>360 kg</td>
<td>250 kg</td>
</tr>
</tbody>
</table>

4.6 Alternative 2

If the contractor fails to receive the requirements of alternative 1 and/or prefers nominal volumetric mix, he shall use the following:
<table>
<thead>
<tr>
<th>Material</th>
<th>50 kg</th>
<th>56 kg</th>
<th>60 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>1 bag of 50 kg</td>
<td>1 bag of 50 kg</td>
<td>1 bag of 50 kg</td>
</tr>
<tr>
<td>Crushed rock sand</td>
<td>1 cu.ft</td>
<td>1 1/4 cu.ft</td>
<td>1 7/5 cu.ft</td>
</tr>
<tr>
<td>Coral sand 10mm to 5mm</td>
<td>1/2 cu.ft</td>
<td>7/8 cu.ft</td>
<td>1 1/4 cu.ft</td>
</tr>
<tr>
<td>Graded aggregates 20mm to 10mm</td>
<td>5/8 cu.ft</td>
<td>7/8 cu.ft</td>
<td>1 1/4 cu.ft</td>
</tr>
<tr>
<td>Graded aggregates</td>
<td>1 7/8 cu.ft</td>
<td>3 cu.ft</td>
<td>3 3/4 cu.ft</td>
</tr>
<tr>
<td>Maximum water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement ratio</td>
<td>5</td>
<td>.56</td>
<td>.60</td>
</tr>
<tr>
<td>Maximum slump</td>
<td>50mm</td>
<td>50mm</td>
<td>50mm</td>
</tr>
</tbody>
</table>

Average works strength obtained from work care of nominal volumating mixes shall be 10% higher than the minimum concrete strengths specified.

### 4.7 Ready Mix Concrete

Ready mixed concrete may be used subjects to the approval of the Engineer.

When it is used the contractor shall ensure that all the requirements of these specifications are complied with. The Engineer may at his discretion waive temporarily the requirements of preliminary trial mixes as required under the heading of trial mixes laid down for alternatives design mix.

Further to requirements the contractor shall ensure that supply and delivery of ready mixes concrete comply with the recommendations of M.S. 1926.

The concrete shall be transported to the site in approved containers and shall be continuously agitated until it is delivered on site. The Contractor shall ensure that no water is added after it is delivered.

For plant mixed concrete the contractor shall check that the delivery note for each batch shows the time when water it first added to the concrete materials, and the time interval between the delivery and the mixing of water is 20 minutes less than the final setting time of cement.

Samples of workscube shall be taken at the place where concrete is finally placed in the structural members.

### 4.8 Waterproof Concrete
Where “waterproof concrete” is specified, sealocate or other approved waterproofing material and plasticizing agent shall be added to the mixing water in the proportion recommended by the manufacturers and strictly in accordance with their written instructions. Waterproof concrete shall be grade B mix and shall meet all the strength requirements of the specified grade, except that the fine aggregate shall consist solely of rock sand.

4.9 **Changing proportion of Aggregates**

The Engineer may at any time during the contract, require the proportions of fine to coarse aggregates to be altered in order to produce a mix of greater strength or improved workability and provided that the total proportions of aggregate to cement remains unchanged, no claim for additional cost will be considered.

4.10 **Testing Equipment**

The Contractor shall provide the following equipment for carrying out control tests on the site:

- Straight edges 3m and 1.2m long for testing the accuracy of the finished concrete;
- A graduated glass cylinder for use in the silt test for organic impurities in the sand;
- Slump test apparatus;
- Six inch steel cube moulds with base plates and tamping rods to B.S. 1881.

4.11 **Work Cube Tests**

Work cubes are to be made at intervals as required by the Engineer and the Contractor shall provide a continuous record of the concrete work. The cubes shall be made in approved 150mm moulds in strict accordance with the Code of Practice.

Six cubes shall be made on each occasion, three from different batches, of the concrete at the place where it is deposited.

Each cube shall be marked with a distinguishing number (numbers to run consecutively) and the code on which it is made. A record shall be kept on site giving the following partitioning.

- Cube No.
- Date Mode
- Location in
- 7-day Test
- Date
Strength
(e) 28-day Test
Date
Strength

Cubes shall be forwarded by the Contractor to an approved Testing Authority, in time to be tested two at 7 days and two at 28 days. The remaining two cubes shall be tested when necessary.

Copies of all work cube Test results shall be forwarded to the Engineer and one shall be retained on the site.

If the prescribed concrete strengths are not attained and maintained throughout the carrying out of the contract, the Contractor will be required to increase the proportion of cement and/or substitute better aggregates so as to give concrete which does comply with the requirements of the contract. The Contractor may be required to remove and replace at his own cost any concrete which fails to attain the required strength as ascertained by Work Cube Tests.

The Contractor must allow in his rates for all expenses in connection with the preparation, conveyance to the Testing Laboratory, and testing of cubes.

CONSTRUCTION JOINTS

5.1 Position of Construction Joints:

Construction joints shall be permitted only at the locations shown on the Drawings or as instructed on the site by the Engineer. In general they shall be perpendicular to the lines of Principal and shall be located at points of minimum shear, viz vertically at, or near, mid-spar or slabs and beams.

5.2 Maximum distance between Construction Joints

Suspended slabs are generally to be cast using alternative bays not exceeding 12m in length. At least 40 hours shall elapse between the adjacent bays/shall be in positions to be agreed with the Engineer.

Beams shall be cast with the slab. Mass concrete shall be cast in alternate bays in lengths not exceeding 7.5m and in depths not exceeding 1.5m. Adjacent sections shall not be cast within 48 hours of each other.

Under no circumstances shall concrete be allowed to fail off but shall be deposited against stopping-boards.

5.3 Preparation of Construction Joints

Before placing new concrete against concrete already set, the face of the old concrete shall be thoroughly backed, roughened and cleaned, and baitance and loose material removed therefrom. Immediately before placing the new concrete the surface shall be saturated with water. A layer of
mortar not less than 25mm in thickness and consisting of 1 part of cement to 1½ parts of fine aggregate shall be applied to the face of the old concrete. All exposed construction joints shall be treated with epoxy resin in accordance with the manufacturer’s instructions.

**EXPANSION/CONTRACTION JOINT**

Joints fillers and sealants shall be of an approved type unless shown on the drawings. Reinforcement or other embedded items bonded to the concrete shall not extend continuously through any expansion/construction joint.

**WATERBARS**

7.1 **Type**

Waterbars shall be P.V.C waterbars of an approved type and shall be provided in the positions indicated on the drawings.

7.2 **Joints**

Joints shall be heat welded in accordance with the manufacturer’s instructions and where the waterbar is to be fixed vertically, metal clips as manufactured by the supplier of the waterbar or of other approved design shall be provided to suspend the waterbar from the reinforcement.

7.3 **Additional Water Bar**

Where waterproof concrete is used the Contractor shall adhere strictly to the position and type of construction joints as detailed on the Drawings. Any deviation from this procedure or the provision of additional construction joints will require the prior approval of the Engineer and any additional waterbars which may be required will be at the Contractor’s expense.

7.4 **Formwork to Water Bars**

Formwork shall be designed with sufficient timber formers and blocking pieces to support the waterbar and to ensure that it is not displaced during concreting. In the case of horizontal joints in vertical walling and similar members of the formwork shall be so constructed as to permit the starter or upstand of concrete surrounding the lower half of the waterbar to be poured in the same operation as the slab or other member from which it springs. Formwork to walls or similar members where a water bar is positioned at the bags of the lift shall have sufficient openings not less than 300mm square at approximately 225mm above the level of the waterbar to permit checking that the waterbar is correctly positioned and not displaced during concreting.

No concreting will be permitted to portions where upstand startup from an integral part until the formwork to the starter has been fixed and approved.
CONCRETE

All sleeves, inputs, anchors and embedded items required for adjoining work or for its support shall be approved by the Engineer and shall be placed prior to concreting and shall be used after an interval of time approved by the Engineer.

All contractors whose work is related to the concrete or must be supported by it shall be given ample time and opportunity to furnish embedded items before concrete is placed.

Expansion joint material, waterstops, and other embedded items shall be positioned accurately and rigidly. Voids in sleeves etc. shall be filled temporarily with readily removable material to prevent concrete entering into them.

PLACING CONCRETE

Concrete Mixer:

The concrete shall be mixed only in approved power driven mixers of a type and capacity suitable for the work. Mixers shall be of a capacity sufficient to take one whole bag of cement per batch. Smaller size mixers shall not be used. The mixer shall be equipped with an accurate water measuring device which shall be checked weekly for accuracy. All materials shall be thoroughly mixed dry before the water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water has been added and until there is a uniform distribution of the materials and the mass is uniform in colour.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed materials shall not exceed the rated capacity of the mixer. Whenever the mixer is started,10% extra cement shall be added to the first batch and no extra payment will be made on this account.

Consistency:

As a check on concrete consistency slump tests may be carried out and shall be in accordance with B.S 1881. The Contractor shall provide the necessary apparatus and allow for the costs of such tests. The slump of the concrete made with the specified water content, using dry materials, shall be determined and the water to be added under wet conditions shall be so reduced as to give approximately the same slump.

Conveying:

The concrete shall be mixed as near to the place where it is required as is practicable to avoid rehandling and flowing, and only as much as be required for a specified section of the work shall be much as is required for a specified section of the work shall be mixed at one time, such section being concerned and finished is one operation without delay. All concrete must be efficiently skilled and used in the works within twenty (20) minutes of mixing. It shall be discharged from the mixer direct either into receptacles or barrows and shall be distributed by approved means which do not cause
segregation or loss of ingredients or otherwise repair the quality of the concrete. Approved mechanical means of handling will be provided they are not longer than 6m and their slope do not exceed 1 vertical to 2 horizontal is not less than 1 vertical to 3 horizontal.

**Depositing**

Placing of concrete in supported elements e.g slab, bed shall not be started until the concrete previously placed in top parts of columns is no longer plastic and has been in place at least for two hours.

Concrete shall be placed from a height not exceeding 1.3m directly into its permanent position and shall not be worked along the shutters to that position. Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs with beams and similar members. The Engineer shall allow concrete to be placed for walls exceeding 150mm thickness from a height approved system of formwork is used.

In addition contractor will ensure that the concrete shall be deposited continuously such that no concrete shall be deposited on concrete which had hardened sufficiently to cause the formation of seams or places of weakness within the section. Placing shall be carried out at such a rate that the concrete which is being integrated with fresh concrete is still plastic.

Concrete in columns may be placed in a height of 3m with careful placing and vibration to achieve satisfactory results. Where the height of the column exceeds 3m suitable openings must be left in the shutters on that this maximum lift is not exceeded.

Concrete shall be placed continuously until completion of the part of the work between construction joints as specified hereinafter or of a part of approved extent. At the completion of a specified or approved part a construction joint of the form and in the positions hereinafter specified shall be made. A record of all such joints must be made by the contractor and a copy supplied to the Engineer.

**Placing concrete under water**

When required concrete shall be deposited under water by an approved method in such a way that the fresh concrete enters the mass of previously placed concrete from within, causing water to be displaced with minimum disturbance at the surface of the concrete.

**Precautions of mixing and placing:**

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing before further concrete is placed. The contractor shall provide runways for concreting to the satisfaction of the Engineer. Under no circumstances will the runways be allowed to rest on the reinforcement.

Care shall be taken that the concrete is not disturbed or subjected to vibrations and shocks during the setting period.
Mixing machines, platforms and barrows shall be cleaned before commencing mixing and be cleaned on every cessation of work.

Where concrete is laid on hardcore, concrete blocks or other absorbent materials, the base shall be suitably and sufficiently wetted before the concrete is deposited.

**Compaction**

**Compaction:**

At all times during which concrete is being placed, the contractor shall provide adequate trained and experienced labour to ensure that the concrete is compacted in the forms to the satisfaction of the Engineer.

**Depth of Compaction:**

Concrete shall be placed neither at a rate greater that will permit satisfactory compaction nor to a depth greater than 750mm before it is completed.

**Vibration of Concrete:**

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuous tamping, spading, slicing, rodding, forking and vibration. Vibration is required for all concrete of grades ‘A’, ‘B’ and ‘C’.

Care shall be taken to fill every part of the forms, to work the concrete under and ground the reinforcement without displacing it and to avoid disturbing recently placed concrete which has begun to set.

Any water accumulating on the surface of newly placed concrete shall be removed and no further concrete shall be placed thereon until such water be removed.

**Internal Vibrators:**

Internal vibrators shall have a frequency of not less than 7,000 cycles per minute and shall have a rotating eccentric weight of at least 2 kg. With an eccentricity of not more than 12mm. Such vibrators shall visibly affect the concrete within a radius of 22mm from the vibrator.

Vibrators shall not be used to move concrete from place to place in the formwork.

At least one internal vibrator shall be operated for every two cubic metres of concrete placed per hour and at least the spare vibrator shall be maintained on site in case of break-down during concreting operations.
External Vibrators

External formwork vibrators shall be of the high frequency less amplitude type applied with the principal direction of vibration in the horizontal plane. They shall be attached directly in the forms at not more than 1.2m centers.

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled with a tamping vibrating speed prior to finishing. Vibrating elements shall be of the low frequency high amplitude type operation at speed of not less than 3,000 r.p.m.

Curing and Protection

Periods and means of curing and protection:

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of massive sacking, polythene sheeting, or other approved means. The protective layer and the concrete itself must be kept continuously wet for at least seven days after the concrete has been placed. The Contractor must allow for the complete covering of all fresh concrete for a period of 7 days. Heasian or polythene sheeting shall be in the maximum widths obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, hessian or other material in small piece.

Protection of foundation concrete

Concrete in foundations and other underground work shall be protected from admixture with falling earth curing and after placing.

Executive loads before curing

Traffic or loading shall not be allowed on the concrete except with the written permission of the engineer.

Faulty Concrete

Any concrete which fails to comply with these preambles or which shows signs of setting before it is placed shall be taken out and removed from the site. Where concrete is found to be defective after it was set, the concrete shall be out and replaced in accordance with the Engineer’s instructions. On no account shall any faulty, honeycombed, or otherwise defective concrete be repaired or matched until the Engineer has made an inspection and issued instructions for the repair. The whole of the cost whatsoever, which may be occasioned by the need to remove faulty concrete shall be borne by the contractor.

Reinforcements

Type of Reinforcement:

The steel reinforcement shall comply with the latest requirement of the following British Standards:

Round mild, medium tensile and to B.S 765 (Imperial units) high tensile and steel bars.
Hot rolled bars for the reinforcement     to B.S 1449 (metric units)
of concrete

Cold twisted steel bars     to B.S 1144 (imported units)

Cold worked steel for the reinforcement   to B.S 4461 (metric units)
of concrete

Fabric reinforcement      to B.S 1221

It shall be in Imperial or Metric sizes as detailed on the drawings.

**Testing of Reinforcement**

If required by the Engineer the contractor shall submit a test certificate of the rollings, and/or shall
arrange for testing by MOW or other approved authority. Reinforcement shall be free from loose mill
scale or rust, grease, paint or other substance likely to reduce the bond between the steel and concrete.

**Fabric Reinforcement**

It shall be of size and/or weight specified and shall be tied with other reinforcements with minimum
225mm laps, using no. 19 S.W.C annealed binding wire.

**Fixing and Reinforcement:**

Reinforcement shall be accurately bent to the shapes and dimensions shown on the Drawings and/or
schedule and in accordance with B.S. 1478. Reinforcement must be cut and bent sold and no welded
joints will be permitted unless so detailed. Reinforcement shall be accurately placed in position as
shown on the drawings and shall be secured against displacement by using No. 18 S.W.C annealed
binding wire or suitable clips at inter-sections and laps, and shall be supported by concrete or metal
supports, steel chairs, spacers or metal hangers to ensure the correct position and cover before
concreting and shall be kept in the same position during concreting. However such supports, chairs etc.
shall have minimum 12mm cover made of concrete blocks where the concrete surface is exposed to
weather and/or without finishes.

No laps shall be permitted except the acres shown on the drawings without the prior approval of the
engineer.

**Spacing Blocks:**

Spacing blocks of approved size and shape made of concrete similar to that used in the surrounding
construction and fixed to the reinforcement or formwork by No. 18 S.W.C wires set into the spacer
blocks or other approved means shall be provided where necessary to ensure that the requisite cover is
tained. The contractor is to include for providing sufficient such spacer blocks in his prices for steel
reinforcement when such supplier has been nominated.
Where composite blocks or minor forms from construction are just spare block are to be provided. These will generally consist of concrete blocks as described above made to fit the width of the rib less 3 mm of reinforcement bars used per on the top surface with wire ties at each

**Concrete cover to reinforcement:**

Unless otherwise instructed the concrete cover to rod reinforcement over main bars in any face shall be:

- Foundations against each face: 3 (75mm)
- Foundations against blinding: 2 (50mm)
- Columns: 1½ (38mm)
- Beams: 1 (25mm)
- Slabs: ½ (13mm)

**Positions and correctness of reinforcement:**

No concreting shall be commenced until the engineer has inspected the reinforcement in position and until he has approved the same. The contractor shall give two clear days notice of his intention to concrete.

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be the contractor’s sole responsibility to ensure that the reinforcement complies with the details on the drawings or schedule and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover.

The contractor will be held entirely responsible for any failing or defect in any portion of the reinforced concrete structure and including any consequent claims, third party claims, etc, where it is shown that the reinforcement has been incorrectly positioned or is incorrect in size or quantity with respect to the detailed Drawings or schedules. Unless permitted by the Engineer, reinforcement shall not be after being embedded in hardened concrete.

**Protection of exposed reinforcement**

Where reinforcement projects frame concrete setting of the structure and this reinforcement is executed to remain exposed to more than a month it is to be with a cement to prevent rust staining on the finished concrete. This is to be brushed off the reinforcement prior to the continuation to converting.

The Contractor shall be responsible for the co-ordination with the Electrical and other sub-contractors for incorporating electrical conduit, pipes, fixing locks, chases, holes and the like in concrete members as required and must ensure that adequate notice is given to sub-contractors informing them when concrete members incorporating the above are to be poured. The contractor shall submit full details including position of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc, to be left in the concrete shall be accurately set out and cast with the concrete.
Position of electrical conduit

Unless otherwise instructed by the Engineer a electrical conduit to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top and bottom steel layers in slabs and similar members. No conduits are to be placed into concrete members having a dimension less than 100mm.

The proposed position of all electrical conduits 25mm and over in diameter which are to be enclosed in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

Formwork

Materials and Design

Formwork shall be constructed of timber or steel or precast concrete or other approved material with sufficient strength to withstand pressure resulting from placing and vibration of the concrete and with rigidity to achieve the specified tolerances.

The design and Engineering of the formwork as well as its construction shall be the responsibility of the contractor. The Formwork shall be designed for the loads, lateral pressure, pressure due to cyclonic winds and other loads likely to be encountered on site.

Shops drawings for formwork including the location and reshoring shall be submitted for approval by the Engineer before erection.

Construction

All formwork shall have joints close enough to prevent leakage of liquid from the concrete and formwork shall be jacked or dedged and clamped or bolted to permit adjustments before concreting and to permit easing and removal of formwork without jarring the concrete. Formwork shall be securely braced and strutted against lateral deflections and vertical movements. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall by consultation with the Engineer ensure that the supporting concrete structure is capable of carrying the load and/or is sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Formwork shall be cambered to compensate for anticipated deflections prior to hardening of the concrete.

Preparation for Concreting

The Contractor’s attention is drawn to the various surfaces textures and applied finishes required and the faces of the formwork next to the concrete must be of such material and construction and be sufficiently true to provide a concrete surface which will in each particular case permit the specified surface treatment or applied finish.
At construction points contact surface of the form squeating for flush surfaces shall overlap 300mm and shall hold right against the hardened concrete to prevent effects or loss of mortar.

Methods of fixing and positioning of the formwork which results in holes through the concrete and/or left in metal ties or similar in the concrete shall require Engineer’s approval.

All surfaces which will be in contact with concrete shall be piled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

Temporary openings shall be provided at the base of columns, wall and seam forms and at any other points where necessary to facilitate cleaning, and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up, and the interior of the form shall be completely cleared of all extraneous materials including accumulated water.

The reinforcement shall then be inspected for accuracy of fixing, immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed.

**Defective Formwork:**

Defective formwork shall be removed or strengthened and improved by the contractor according to the instructions by the Engineer.

**Formwork to Construction Joints etc.**

Formwork forming the construction joints and expansion joint shall be rigid, tight to avoid loss of mortar and true in square.

Formwork shall be inspected and passed by the Engineer before placing reinforcement and concreting.

**Stripping Formwork:**

Formwork shall be removed without undue vibration or shock and without damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows:

- Beam side walls and columns (unloaded) 2 days
- Slab soffits (with props designed to left under) 7 days
- Beam soffits (with props designed to left under) 10 days

Subject to work cubes achieving the specified strengths and the loads due to construction on them being lighter than the designed loads. The props can be removed for:

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<th>Item</th>
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<td>Slab</td>
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If the Contractor wishes to take advantage of the shorter stripping times as permitted above for beam and slab soffits when props are left in place, he must so design his formwork that sufficient props as agreed with the Engineer can remain in their original position without being moved in any way until expiry of the minimum time for removal of props. Stripping and re-propping will not be permitted.

Contractor shall be responsible for consequent damage arising from early stripping of formwork.

**Making good:**

After removal of formwork all projections, etc, on the concrete surface shall be chipped off, and made good to the requirements of the Engineer. Any voids or honeycombing shall be treated as described in “faulty concrete”.

**Fair-face etc.**

Where fair-face is specified the contractor shall make a sample of area formed by sides not less than 1.2m for approval by the Engineer and the Architect. Same will apply to Board Marked. Tamped and finishes.

**Related Uniformed Surfaces**

Top of walls or buttresses, horizontal offsets and similar unformed surfaces occurring immediately adjacent to formed surfaced shall be struck smooth after the concrete is placed and shall be floated to a texture reasonably insistent with that of the formed surfaces.

**PRECAST CONCRETE**

**General Requirements**

Unless otherwise approved by the Engineer, all precast concrete construction shall be carried out on the site and shall conform to requirements given elsewhere in these preambles.

The maximum size of coarse aggregate in precast concrete shall not exceed 20mm except for thickness less than 75mm where it shall not exceed 12mm.

The compacting of precast concrete shall conform with requirements given elsewhere in these preambles except for thin slabs where use of immersion type vibration is not practicable. The concrete in those slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

**Steam Curing**

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.
The precast work shall be made under cover and shall remain under the same cover and shall remain under the same for seven days. During this period and for a further seven days the concrete shall be shielded by sacking or other approved material kept constantly wet. It shall then be stacked in the open for at least a further seven days to season before being set in position. Where steam curing is used these times may be reduced subject to the approval of the Engineer.

Method of Handling:

Precast concrete units shall be constructed in individual forms. The method of handling the precast concrete units after casting, during curing and during transport and erection shall be subject to the approval of the Engineer, providing that such approval shall not relieve the Contractor of responsibility for damage to precast concrete units resulting from careless handling.

Repairs:

Repair of damage to the precast concrete units, except for minor abrasions of the edges which will not impair the installation and/or appearance of the units will not be permitted and the damaged units shall be replaced by the Contractor at his own expense.

Moulds

Except where precast work is described as “fair-face” the moulds are to be made of metal or are to have metal or plywood linings or are to be other approved moulds which will produce a smooth dense fair face to the finished concrete suitable to receive a painted finish direct and free from all shutsed marks, holes, pittances, etc. In his prices for such precast work the Contractor shall include for all rubbing down to produce the finish required to the satisfaction and approval of the Engineer and the Architect.

Where precast work is to have an exposed aggregate as finish the moulds shall be constructed to the requirements given for moulds for “fair face” work. The method of achieving the exposed aggregate finish shall be the aggregate transfer or other approved methods. A sample showing the required finish and shape shall be approved by the Architect/Engineer.

The precast units shall be installed to the lines, grades and dimensions shown on the Drawings or as directed by the Engineer.

**COMPOSITE FLOOR SLABS**

**Size, type and concrete mix for floor block:**

Concrete hollow blocks for use in the composite floor slabs are to be size and shape as shown on the Drawings with 25mm wall thickness and are to be of adequate strength to support the concrete during placing and consolidation by vibration. Blocks are to be manufactured in accordance with the procedure specified in B.S 2028 and to be of a mix not weaker than 1:10 cement: combined aggregates using maximum 10mm size aggregate. No coral sand shall be used in making of concrete blocks.

Concrete blocks are to be cured for at least 28 days before use of the site. During the first seven days of curing, blocks are to be kept permanently damp and protected from exposure to sun and wind.
Concrete blocks are to be well wetted before the pouring of concrete.

**Composite Floor Construction**

The hollow block floor construction is generally to be as shown on the Engineer’s Drawings. Care shall be taken in placing blocks to ensure that they are set out in accordance with the details shown on the Drawings and that they run truly in line without encroaching on the width of the in-situ ribs.

The open ends of hollow blocks adjacent to the concrete to be placed in-situ are to be plugged or stopped previously with mortar or concrete to prevent the concrete from flowing into the void and the contractor is to include for this in his prices.

The Contractor should note that slip tiles are not to be used to the soffit of ribs and he is to take this into consideration in pricing the items of formwork to the soffit of hollow block floor construction.

Before concreting is carried out the blocks are to be thoroughly wetted.

Care should be taken during concreting that the width of ribs between the rows of blocks and of the solid in-situ concrete shown on the Drawings adjacent to supporting beams is not encroached upon by the blocks. It is essential that the concrete topping be poured at the same time as the ribs between hollow blocks.

**Fixing of rib reinforcement**

Reinforcement shall be positioned accurately with required cover in accordance with the Drawings and using the particular spacing blocks with wire ties as previously described. Spacer blocks shall be provided in ribs at not more than 1.2m centres. Care must be taken during concreting that the reinforcement is not displaced.

Where holes for services, etc. occur, the necessary holes or pockets shall be accommodated by the replacing of a hollow block by in-situ concrete or the widening of a rib all in accordance with the Engineer’s instructions. Prices for holes, etc. through hollow block construction are to include the rearrangement or substitution of the hollow block with solid concrete in addition to the actual formation of the hole.

**NOTES CONCERNING MEASUREMENT AND PRICING**

The Contractor must allow for all costs incurred during the progress of the Contract for complying with the provisions concerning the preparation and use graded mixes.

Prices for concrete shall include for mixing and depositing as described or indicated and for hoisting and depositing at the various levels required throughout the building, and shall also include for forming or hacking a satisfactory key for all faces receiving asphalt and plaster work. Prices for slabs shall also
include for levelling off the surface as described under “compaction”, and all temporary formwork to form construction joints at bay edges.

Prices for reinforced concrete shall, in addition, include for filling into, between or on formwork and thoroughly compacting between and around rods or fabric reinforcement and for forming all additional construction joints between varying mixes. Where described as vibrated, prices must include for fully vibrating as described.

Formwork (use and waste only is measured net to the actual surface of the concrete to be supported and the prices for formwork shall include for extra material at joints, extra labour and waste for narrow widths, small quantities, overlaps, passings at angles, straight cutting and waste, splayed edges, notchings, etc and for fixing at the various levels including battons, struts and supports and for bolting, jacking, wedging, easing striking and removal. Prices for linear items such as boxings shall include for angles and ends. Strutting has been measured at varying levels to slab soffits only and prices for other items must include for strutting at any level.

Prices for steel rod reinforcement shall include for cutting to lengths and all labour in bending and cranking, forming hooked ends, handling, hoisting and fixing in position and for providing all necessary tying wire and supports. Prices for fabric reinforcement shall include for all straight cutting and waste, handling, hoisting and fixing in position, providing all necessary tying wire, and supports and all extra material in laps.
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PRELIMINARIES AND GENERAL COSTS

1. Ordering of Materials
   fitting an equipment
   The selected Contractor shall place orders at the very beginning of the contract for materials, fittings and items of equipment required for this work.
   Non-availability of these items will not be considered as an excuse for delay on the works.

2. Discrepancies
   Should the Contractor at any time discover discrepancies between drawings, description of works or any other documents or in dimensions instructions, he shall immediately refer same to the Employer who shall decide the course to be followed. Failure on the part of the Contractor to comply with this Clause may invalidate any subsequent claim made by him.

3. Contractor to visit site
   Contractor shall visit the site before tendering and ascertain the nature of the ground and subsoil to be excavated, the contours thereof and acquaint himself with local conditions, site conditions, site restriction, working space available, means of access, limitation and restrictions to access, risk of damage to adjacent properties, roads, etc.
   The contractor will have to carry out any other survey that in his opinion is necessary for him to submit a proper proposal. This survey shall also include the services underground or above that may run on site and he shall allow in his offer for their deviation if required.

4. Area to be occupied by Contractor
   The area of the site which may be occupied by the Contractor for his use as storage or for erection of workshops etc, shall be defined on this site by the Employer.

5. Access to Site and Temporary Roads
   Means of access to the site shall be agreed with the Employer prior to the commencement of the work and Contractor must allow here for building any temporary access roads, gantries for the transport and lifting of all materials, plants and workmen required for the complete execution of the works, including the provision of temporary culverts, crossing bridges or other means of gaining access to the site.
   Upon the completion of the works the Contractor shall leave such temporary, access roads, culverts etc. Undisturbed unless ordered otherwise by the Employer. No claims will be entertained for such temporary services left on site or for their removal and restoration on the site to the original condition.
### 6. **Maintenance of Roads**

The Contractor shall allow for maintaining and keeping public and private roads free from mud debris, etc., arising from the works throughout the duration of the contract.

### 7. **Plant, Tools, Scaffolding etc...**

The Contractor shall provide all necessary plants, tools scaffolding and vehicles for the efficient and expeditious execution of the works and at or before completion clear same from building and site and make all good.

### 8. **Setting Out**

The Contractor shall set out the works in accordance with the dimensions and levels shown on the approved drawings and shall be responsible for the correctness of all dimensions and levels so set out by him. He will be required to rectify all errors arising from inaccurate setting out at his own cost and expense. In event of error or discrepancy in the dimensions or levels marked out on the drawings being discovered, such errors or discrepancies shall be reported by the Contractor to the Employer for his immediate consideration.

No work connected with such errors shall be continued by the Contractor until he has received written instructions from the Employer to adjust such discrepancies.

### 9. **Discharge of Workmen**

The Contractor shall only employ qualified foremen, artisans and labourers on the works. If, in the opinion of the Employer any person employed by the Contractor misconducts himself or is likely to cause or has caused strikes, quarrels or delays, or is incompetent the Contractor, when so directed by the Employer in writing shall at once remove such person from the works site.

### 10. **Government Ordinance and Regulations**

The Contractor must also make himself acquainted with current ordinance and any Government regulations regarding the movement housing security and control of labour camps, passes for transport etc... and allowance must be made in his Tender for compliance therewith in so far as they are practicable. It is important that the Contractor before tendering shall obtain from the relevant Authority the fullest information regarding all such regulation and/or restrictions which may affect the organisation of work, supply and control of labour, etc... and allow accordingly in his Tender. No claim for want of knowledge in this connection will be entertained.

### 11. **Water, Light and Power, telephone**

The Contractor shall provide at his own risk and cost the water, light and power required for use in the work and make them available free of charge to sub-contractor and others.

The Contractor will be required to arrange for the installation of a temporary connection to the main water supply and to provide himself with all necessary temporary water piping and storage tanks as required or directed, remove same and make
good disturbed surfaces at completion to the satisfaction of the Employer and pay all charges for meter hire and water consumed until the completion of works.
The Contractor shall provide and maintain a temporary telephone service on site for the full period of the contract at his own costs.

12. Watching and Lighting

The Contractor, from commencement of the contract, shall provide all watching lighting and protection of the works, materials and public through fares as may be necessary for the safety of the works, and for the protection of the public and his own employees.

13. Sheds for Storage of Materials

The Contractor shall provide and maintain to the satisfaction of the Employer and clear away on completion of the works water tight sheds for the storage and protection of all materials required for the proper execution of the work. He shall also provide storage sheds as may be required by sub contractors nominated sub-contractors and nominated suppliers and remove same when ordered.

14. Foreman’s Office

The Contractor shall provide a temporary office for the use of the foreman on the site in a position to be agreed by the Employer.

16. Sanitation for work People

Adequate sanitary accommodation for his work people etc... shall be arranged and maintained by the Contractor to a standard satisfactory to the Ministry of Health or Health and Sanitation Department of the Local Authority/District Council and/or Labour Inspector.

The Contractor shall provide satisfactory housing for the watchman and water-borne latrine, accommodation for the labour employed on site. Whether by himself or by nominated sub-contractors and/or suppliers and arrange for and pay all charges in connection therewith and allow for removing same and leaving ground clean and free from pollution to the entire satisfaction of the Employer.

17. Sign Board

The sign boards for the display of the General and sub-contractor’s names shall be approved size and design with neat and uniform lettering.

18. Testing of Material

The Employer shall make such tests of the samples of any materials as he may at his discretion deemed desirable, and the cost of such tests shall be added to the Contract Sum unless the result of such tests causes the Employer to reject any samples or materials as not being in his opinion in accordance with the specification in which case the Contractor shall pay for such tests and the cost thereof shall be recovered therefrom from the Contractor by deduction from the Contract Sum.
19. **Protective and Delivery** The Contractor shall allow for covering up and protection of work liable to damage, including temporary roofs, gutters, drains etc. If necessary, case up, cover, or in other suitable way protect all finished work liable to injury to the satisfaction of the Employer until completion of the contract. On completion the whole of the works shall be delivered up clean, complete and perfect in every respect to the satisfaction of the Employer.

20. **Employer’s facilities** The Contractor is to allow for the costs of facilities on site but not limited to the following:

(i). **Office for Supervisory Staffs** The Contractor shall provide effect and maintain where directed on the site an approved weather and sunproof temporary office for use of the Supervisory staffs floor size of 6m” x 3m and shall provide the following:

   (b) A long suitable table size 80” X 30”
       (2440 mm X 915 mm)
   (b) 8 Chairs
   (c) 1 pin Board

(ii) **Survey and Testing Equipment** As may be necessary on site.

21. **Removal of Plant and Rubbish** The Contractor shall, upon completion of the works, at his own expense remove and clear away all plant, rubbish and unused materials and shall leave the whole of the site in a clean and tidy state to the satisfaction of the Employer. He shall also remove all rubbish and dirt from the site as it accumulates at the discretion of the Employer.

22. **Hoardings** The Contractor is to provide for all necessary hoardings, as appropriate, along the boundaries allocated to him in order to secure the site.

23. **Restrictions** Allow for the cost of restrictions including but not limited to the following:

   (a) **Limitation of Workmen:** The Contractor shall keep all persons including those employed by Sub-contractors under control and within the boundaries of the area allocated to him.

   (b) **Limitation of construction activity** The Contractor shall be required to limit the construction activity. Temporary buildings, storage of equipment and materials etc within the boundaries of the area allocated to him.