REPUBLIC OF MAURITIUS

AGRICULTURAL MARKETING BOARD

CONSTRUCTION OF A GARLIC SEED STORE AT AMB

REF: OAB/AMB 03/17

BIDDING DOCUMENTS

VOLUME 1 of 2

INSTRUCTIONS TO BIDDERS
BIDDING DATA SHEETS
BIDDING FORMS
BILLS OF QUANTITIES
CONDITIONS OF CONTRACT
CONTRACT FORMS
TENDER DRAWINGS

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MARCH 2017

Agricultural Marketing Board

Construction of a Garlic Seed Store At AMB

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PART 1

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Section I - Instructions to Bidders

A. General

1. Scope of Bid

1.1 The Public Body as defined[1] 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*

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[1] *See Section IV, "General Conditions of Contract," Clause 1. Definitions.*

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) 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.

(c) 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.

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

(e) Bidders are strongly advised to consult the website of the CIDB *cidb.govmu.org* for further details concerning registration of contractors.

5.2 (a) Subject to ITB 5.6, a Bidder, and all parties constituting the Bidder, may have the nationality of any country except in the case of open national bidding where the bidding documents may limit participation to citizens of Mauritius or entities incorporated in Mauritius, if so qualified in the BDS.

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

(c) 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

(b)Bids from contractors appearing on the ineligibility lists of African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank Group and World Bank Group shall be rejected.

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.** 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) valid registration certificate with the CIDB;

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

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

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

(e) 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;

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

(g) authority to seek references from the Bidder's bankers;

(h) information regarding any current litigation, in which the Bidder was/is involved, the parties concerned, the issues

involved, the disputed amounts, and awards; and

(i) proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price.

6.3 To qualify for award of the Contract, bidders shall meet the following minimum qualifying criteria:

a) registered with the CIDB under the grade **specified in the BDS.**

(b) 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]

Pending litigations against the Applicant or any partner of a Joint Venture may result in Disqualification.

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.

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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.*

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 Document

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 needed.

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) Technical Proposal as per ITB 18.1;

(d) completed Bill of Quantities / Activity Schedule;

(e) 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

(f) 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[3] 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.[4] 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

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[3] *In lump sum contracts, delete "priced Bill of Quantities" and replace with "priced Activity Schedule."*

[4] *In lump sum contracts, delete "described in the Bill of Quantities" and replace with "described in the drawings and specifications and listed in the Activity Schedule."*

[5] *In lump sum contracts, delete "rates, prices, and."*

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 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 ITB13.

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

31.1 Provided that the bid is substantially responsive, the

Arithmetical Errors

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

(ii) an executive summary of the Bid Evaluation Report.

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

AGRICULTURAL MARKETING BOARD

CONSTRUCTION OF A GARLIC SEED STORE AT AMB
OAB/AMB 03/17

Mandatory list

The following Instruction to Bidders shall be mandatory:
ITB 6.2 (a)
ITB 6.2 (b)
ITB 6.2 (c)
ITB 6.2 (e)
ITB 6.3 (a)
ITB 6.3 (b)
ITB 6.3 (c)
ITB 6.3 (d)
ITB 6.3 (e)
ITB 13.1
ITB 19.1
ITB 20.1

Section II- Bidding Data Sheet

A. General	
ITB 1.1	The Public Body is: Agricultural Marketing Board The scope of the works are as follows: • Construction of building of about 152m² gross floor area. The building shall be generally an in-situ reinforced framed structure with concrete slightly sloping suspended roof, reinforced concrete columns, beams, and blockwalling envelope. Roof screed with additives laid to falls and cross falls to be provided. Roof waterproofing shall be by others. The building shall be rendered externally and internally, painted externally with anti-fungus paint and internally with emulsion paint, complete with powder coated aluminium openings and roller shutters, with monolithic power floated floor finish and including electrical installation, plumbing works and loading bay and connecting platform. • Upgrading works to existing seed office of about 36 m², located in existing seed store with dismantling of existing timber partitioning, roof sheeting, timber false ceiling, doors and windows and hand over to Client as salvaged material. Provision is made for new blockwalling partition to new office and with an including new aluminium doors and windows, with new metal roof sheeting laid on timber support and complete with finishes and mechanical and electrical work. The name and identification of the Contract are: **OAB/AMB 03/17** The Project is Construction of Seed Store at AMB Complex at Moka
ITB 1.2	The Intended Completion period is **183 Calendar days** from start date.
ITB 3.2	(a) The address to file Challenges in respect of this procurement is: **The General Manager** **Agricultural Marketing Board** **Dr. Leclezio Avenue** **Moka** (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
ITB 6.2 (a)	Delete this sub clause and replace by The minimum qualifying criteria to be met are: - (i) Contractor must have carried out two (2) building and civil engineering works, each, for a value of **MUR 4.00 million** over the last 5 years. *This sub-clause shall not apply for bidders complying with sub-clause 6.3 of ITB*
ITB 6.2 (b)	Bidders should have at least five years of experience as Contractor in building and civil engineering works comprising also the building engineering services component. Bidders shall submit brief description of the completed project, indicating the contract price, the Final Account and enclosing a copy of Completion Certificate duly signed by the relevant Consultant and a copy of the Letter of Award. *This sub-clause shall not apply for bidders complying with sub-clause 6.3 of ITB*
ITB 6.2 (c)	The essential equipment to be made available for the Contract by the successful Bidder must be: **Pneumatic breaker (2 Nos.), Concrete mixer (0.5 m³) (1 No.), Poker vibrators (3 Nos.), Backhoe excavator (0.25 m³) and Wheel mounted (1 No.)**
ITB 6.2 (d)	Please refer to 6.3 (d)
ITB 6.2 (e)	Delete this sub clause and replace by Audited accounts for the past three years. To be eligible for award, bidders should have earned profit for at least one year, for the past three years. *This sub-clause shall not apply for bidders complying with sub-clause 6.3 of ITB*
ITB 6.2 (f)	The assessment of the financial soundness of the company shall be on a pass/fail basis on its overall performance including its profitability.
ITB 6.3 (a)	The Contractor must have a valid registration in line with the CIDB Grade G
ITB 6.3 (b)	(A1) The Contractor shall demonstrate that it is registered with the CIDB with clear indication of its area of specialization. Bidder shall submit brief description of the completed project, indicating the contract price and final account.

ITB 6.3 (c)	The essential equipment to be made available for the Contract by the successful Bidder shall be: **Concrete mixer (0.5 m³), poker vibrators and excavator.**
ITB 6.3 (d)	• One full time site Supervisor who must be a holder of Diploma in Civil Engineering from a recognized University or similar acceptable equivalent qualification and having minimum 5 years' experience in supervising Building and Civil Engineering works, finishes and supervising quality control process on site, as well overall overview of MEP work. • One M&E Coordinator having a Diploma in Building Services Engineering from a recognized University or similar acceptable equivalent qualification and having minimum 5 years' experience in coordination of building engineering services, quality control and supervising MEP work. His availability on site shall be of a minimum of 4 hours daily, attend site meetings and coordination/supervision/submission of shop drawings and other duties. • One registered health and safety officer.
ITB 6.3 (e)	The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be **MUR 1.00 Million. Bidder shall submit updated evidence from local commercial bank. The bank testimonial shall be dated not more than one month prior to the date of submission of bids and shall mention the name of the project.** Bank Certificate for testimonial shall be as per prescribed as attached Appendix A
B. Bidding Documents	
ITB 7.1	Delete entire contents of this Sub clause (7.1) and replace by the following: The Bidding Documents consist of Volume 1 and 2 which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 10. **Volume 1 – Bidding Procedures and Conditions of Contract** Part 1-Bidding Procedures Section I – Instructions to Bidders (ITB) Section II – Bid Data Sheet (BDS) Section III – Bidding Forms, Bills of Quantities & List of drawings Section IV – Evaluation Criteria and Qualification Criteria Part 2- Conditions of Contract and Contract forms Section V – General Conditions of Contract for works of Civil Engineering Construction.

	Part I – General Conditions – Fourth Edition 1987 **Reprinted 1992, refer to:** **FIDIC Secretariat** **P.O Box 86** **1000 Lausanne 12** **Switzerland** **Facsimile: 41 21 653 5432** **Telephone: 41 21 653 5003** Section VI – Conditions of Particular Application Part II FIDIC Section VII – Contract Forms Part 3- Employer's Requirements Section VIII – Technical Specifications **Volume 2 – Tender Drawings**
ITB 8.1	The Public Body's address for clarification is: **The General Manager** **Agricultural Marketing Board** **Dr. Leclezio Avenue** **Moka** **Tel: 4334025; Fax: 4334837** **Email Address**: agbd@intnet.mu
ITB 9.1	A Pre-bid meeting is scheduled on **14th March** at **14.00** Hrs and the venue is: **Board Room** **Agricultural Marketing Board** **Dr. Leclezio Avenue** **Moka**
	C. Preparation of Bids
ITB 13.1 (f)	The following schedules shall be submitted with the bid: ***(a)Contractor shall submit a detailed method statement and methodology as regards to the building work, M&E works and site works.*** ***(b) Programme of works with activity schedules for building works, Mechanical and Electrical works, Aluminium openings, Finishes, all in compliance with the technical specifications and conditions of contract.*** ***(c) Priced Bill of Quantities*** ***(d) Site Establishment Layout*** ***(e) Identifications of proposed specialist subcontractors with supporting documents detailing their resources, equipment, key personnel to be deployed for the works together with details of their work experience of a similar nature as the***

	proposed work.
ITB 17.1	The Contract is not subject to price adjustment in accordance with Sub Clause 70.1 & 70.2 of the general Conditions of contract.
ITB 17.2	Interim Payment for Plant and Material on site is applicable as per Sub **Clause 60.2 (c)** of the Conditions of Contract and on 100% of the value of invoice.
ITB 19.1	The Bid shall be valid for *Ninety (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	Bidder shall furnish a subscription to a bid securing declaration as per Appendix Section III of bidding form.
D. Submission of Bids	
ITB 23.1	The deadline for submission of bids shall be the **3rd April** by **14.00** Hrs.
	The Employer's address for the purpose of Bid submission is **Tender Box** **The Registry** **Agricultural Marketing Board** **Dr. Leclezio Avenue** **Moka** Tel: 4334025 Fax: 4334837
E. Evaluation and Comparison of Bids	
ITB 26.1	The bid opening shall take place at: **Board Room** **Agricultural Marketing Board** **Dr. Leclezio Avenue** **Moka** Date: **3rd April** Time: **14.15** hrs.

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. Performance Bond and Advance Payment Guarantee shall be given for phases, as per the provisions of the Contract. The Engineer shall certify works completed for each phase, to allow Contractor to give Performance Bond and Advance Payment Guarantee for the next phases. Unless and until the Contractor submit Performance Bond and Advance Payment Guarantee, no advance payment shall be issued.
ITB 41	The Advance Payment shall be limited to *10%* percent of the Contract Price less contingencies sum. The advance payment shall be effected against a guarantee issued by a local commercial bank as per format contained in section VIII of the Bidding Document. Performance Bond and Advance Payment Guarantee shall be given for phases, as per the provisions of the Contract. The Engineer shall certify works completed for each phase, to allow Contractor to give Performance Bond and Advance Payment Guarantee for the next phases. Unless and until the Contractor submit Performance Bond and Advance Payment Guarantee, no advance payment shall be issued.
ITB 42.1	Interim Payment for Plant and Material on site is applicable, as per Sub Clause 60.2 (c) of the Conditions of Contract and on 100% of value of invoice.

Annex A

Specification Compliance

The Bidder shall submit full documentation, including catalogues, specifications and brochure for the following materials referred in the Bills of Quantities and upon which the Bidder based his tender for the execution of the Works.

A. ARCHITECTURAL WORKS

(i) **Doors & Windows**

Aluminium Openings
Roller shutter

B. Mechanical and Electrical Works
Electrical Cables
Switches & Sockets
Light Fittings
Pipes
Fire Alarm/Smoke detectors/sounders
Extraction equipment

Annex B

LIST OF SPECIALIST SUBCONTRACTORS
(To be filled in by Bidder)

The Bidder must state hereunder the name (or names) of the Domestic Sub-Contractor (or Sub-Contractors) to be appointed by him to carry out the Sub-Contract Works.
Full details of experience and key personnel are to be enclosed by the Bidder.

	Sub-Contract Works	**Name of Domestic Sub-Contractor**
(i)	Aluminium windows	
(ii)	Electrical Works	
(iii)	Roller Shutters	
(iv)	Roof Waterproofing	
(v)	Anti-termite treatment	

Name:.....

For and on behalf of: .....

Company Stamp:
(Main Contractor)

Annex C

LIST OF MATERIALS ON SITE FOR PAYMENT PURPOSES

1. Cement
2. Reinforcement
3. Aggregates
4. Blocks
5. Aluminium Windows, Roller Shutters, tiles and appliances
6. Pipes
7. Electrical cables, fittings, light fittings, switch and sockets

SECTION III

BIDDING FORMS, BILLS OF QUANTITIES, MAIN SUMMARY, LIST OF DRAWINGS

BILLS OF QUANTITIES

BILL NO 1

PRELIMINARIES AND GENERAL ITEMS

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	PRELIMINARY PARTICULARS		
	Abbreviations		
A	In these documents the following abbreviations shall have the meanings assigned to them respectively below:		
	BS — British Standard		
	MS — Mauritius Standard		
	CP — British' Standard Code of Practice		
	Cu m or m3 — Cubic metre		
	Sq m or m2 — Square metre		
	Lin m or m — Linear metre		
	mm — Millimetre		
	Nr — Number		
	N — Newton		
	KN — Kilonewton		
	Kg — Kilogram		
	(m/s) — Measured separately elsewhere in these Bills of Quantities.		
	n.e — Not exceeding		
	150-300mm — (or the similar expression it is implied that the dimensions are exceeding the first figure stated and not exceeding the second figure stated		
	As described — Shall mean as described in the Specifications and/or in these Bills of Quantities and/or in the Drawings.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Units		
A	All quantities and dimensions in the Bills of Quantities, Specifications, and the Drawings are given in the **"System International D'Unites"** (S.I Units).		
	Location of the Works		
B	The Site of the Works is located at **Moka** as shown on the Engineer's location plan.		
C	**General description of the works**		
	The Scope of Work is as follows: • Construction of building of about 152m² gross floor area. The building shall be generally an in-situ reinforced framed structure with concrete slightly sloping suspended roof, reinforced concrete columns, beams, and blockwalling envelope. Roof screed with additives laid to falls and cross falls to be provided. Roof waterproofing shall be by others. The building shall be rendered externally and internally, painted externally with anti-fungus paint and internally with emulsion paint, complete with powder coated aluminium openings and roller shutters, with monolithic power floated floor finish and including electrical installation, plumbing works and loading bay and connecting platform. • Upgrading works to existing seed office of about 36 m², located in existing seed store with dismantling of existing timber partitioning, roof sheeting, timber false ceiling, doors and windows and hand over to Client as salvaged material. Provision is made for new blockwalling partition to new office and with an including new aluminium doors and windows, with new metal roof sheeting laid on timber support and complete with finishes and mechanical and electrical works.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
A	**Completion Period** The overall completion period shall be **183 Calendar days.**		
B	**Preliminary Investigation** The Contractor is advised to visit the site before submitting his tender and ascertain the nature of the ground and subsoil to be excavated, the contours thereof and acquaint himself with local conditions, site conditions and site restrictions. Contractor is advised that the Employer's operation shall be ongoing during the construction stage. The contractor shall not allow workers to loiter outside the boundaries of the site, and shall ensure that no debris are dumped in the surroundings. The site must be kept clean and tidy during the construction period. The Tenderer shall allow for temporary access to the site, with temporary hoarding gates, on allocated areas and ensure adequate security net. Contractor shall comply with the provisions of Occupational Health and Safety Acts and any standing regulations. On completion of the work the Contractor shall clear away all temporary hoarding protection to the satisfaction of the Engineer. Notwithstanding the cleaning process, Contractor shall ensure all debris along with Client's walkway and driveway are duly removed and site is kept clean and tidy. Contractor must take all necessary precaution to protect all incoming services, carry out such trial pit to locate the under services and such protection as required. Should the Contractor damage any under services, instant remedial action need to be taken to ensure there is no disruption in the smooth operation of the Employer's business. Should the Contractor damage the access driveway parking, all shall be reinstated and even a new resurfacing work shall be carried out at the cost of the Contractor, to the satisfaction of the Architect. Contractor shall allow charges in this respect in the contract price. The contractor is informed that the Employer's insurance company is Mauritius Union Assurance Company Limited. The bidder will be required to take CAR Insurance cover from Employer's Insurance company. The bidder shall liaise with the latter, phone no: 207 55 00 for obtaining the Contractor's All Risks Insurance. (CAR Insurance)		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	CONDITIONS OF CONTRACT		
	Form of Agreement and Conditions of Contract		
A	The Form of Agreement and Conditions of Contract will be the Conditions of Contract for works of Civil Engineering Construction; Part 1 General Conditions and Part II Conditions of Particular Application, Fourth Editions 1987, reprinted 1992 with further amendments as published by Federation Internationale des Ingenieurs Conseils (F1DIC) as may be amended and as particularly noted or amended by the special requirements of these bills. Conditions of Contract may be consulted at Architect's office during working hours.		
B	The Clause headings of the schedule of conditions are given below and the Contractor is referred to the above-mentioned documents which are enclosed in the Bill, for the full intent and meaning of each clause thereof. These clauses are hereinafter referred to by clause number and heading only.		
C	The Contractor is to allow hereunder or in his price whatever costs or charges he may consider necessary for the carrying out, complying with and due observance in respect of any or all of the clauses of the Conditions and of the said notes and amendments.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Clause No **PART 1: GENERAL CONDITIONS**		
	Definitions and Interpretation		
	1.1 Definitions **1.2** Headings and Marginal Notes **1.3** Interpretation **1.4** Singular and Plural **1.5** Notices, Consents, Approvals, Certificates and Determinations		
	Engineer and Engineer's Representative		
	2.1 Engineer's Duties and Authority **2.2** Engineer's Representative **2.3** Engineer's Authority to Delegate **2.4** Appointment of Assistants **2.5** Instructions in Writing **2.6** Engineer to Act Impartially		
	Assignment and Subcontracting		
	3.1 Assignment of Contract **4.1** Subcontracting **4.2** Assignment of Subcontractor's Obligations		
	Contract Documents		
	5.1 Language/s and Law **5.2** Priority of Contract Documents **6.1** Custody and Supply of Drawings and Documents **6.2** One Copy of Drawings to be Kept on Site **6.3** Disruption of Progress **6.4** Delays and Cost of Delay of Drawings **6.5** Failure by Contractor to Submit Drawings **7.1** Supplementary Drawings and Instructions **7.2** Permanent Works Designed by Contractor **7.3** Responsibility Unaffected by Approval		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	General Conditions (Cont.)		
	8.1 Contractor's General Responsibilities		
	8.2 Site Operations and Methods of Construction		
	9.1 Contract Agreement		
	10.1 Performance Security		
	10.2 Period of Validity of Performance Security		
	10.3 Claims under Performance Security		
	11.1 Inspection of Site		
	12.1 Sufficiency of Tender		
	12.2 Not Foreseeable Physical Obstructions or Conditions		
	13.1 Work to be in Accordance with Contract		
	14.1 Programme to be Submitted		
	14.2 Revised Programme		
	14.3 Cash Flow Estimate to be Submitted		
	14.4 Contractor not Relieved of Duties or Responsibilities		
	15.1 Contractor's Superintendence		
	16.1 Contractor's Employees		
	16.2 Engineer at Liberty to Object		
	17.1 Setting-out		
	18.1 Boreholes and Exploratory Excavation		
	19.1 Safety, Security and Protection of the Environment		
	19.2 Employer's Responsibilities		
	20.1 Care of Works		
	20.2 Responsibility to Rectify Loss or Damage		
	20.3 Loss or Damage Due to Employer's Risks		
	20.4 Employer's Risks		
	21.1 Insurance of Works and Contractor's Equipment		
	21.2 Scope of Cover		
	21.3 Responsibility for Amounts not Recovered		
	21.4 Exclusions		
	22.1 Damage to Persons and Property		
	22.2 Exceptions		
	22.3 Indemnity by Employer		
	23.1 Third Party Insurance (including Employer's Property)		
	23.2 Minimum Amount of Insurance		
	23.3 Cross Liabilities		
	24.1 Accident or Injury to Workmen		
	24.2 Insurance Against Accident to Workmen		
	25.1 Evidence and Terms of Insurances		
	25.2 Adequacy of Insurances		
	25.3 Remedy on Contractor's Failure to Insure		
	25.4 Compliance with Policy Conditions		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	General Conditions (Cont.)		
	26.1 Compliance with Statutes, Regulations		
	27.1 Fossils		
	28.1 Patent Rights		
	28.2 Royalties		
	29.1 Interference with Traffic and Adjoining Properties		
	30.1 Avoidance of Damage to Roads		
	30.2 Transport of Contractor's Equipment or Temporary Works		
	30.3 Transport of Materials or Plant		
	30.4 Waterborne Traffic		
	31.1 Opportunities for Other Contractors		
	31.2 Facilities for Other Contractors		
	32.1 Contractor to Keep Site Clear		
	Labour		
	34.1 Engagement of Staff and Labour		
	35.1 Returns of Labour and Contractor's Equipment		
	Materials, Plant and Workmanship		
	36.1 Quality of Materials, Plant and Workmanship		
	36.2 Cost of Samples		
	36.3 Cost of Tests		
	36.4 Cost of Tests not Provided for		
	36.5 Engineer's Determination where Tests not Provided for		
	37.1 Inspection of Operations		
	37.2 Inspection and Testing		
	37.3 Dates for Inspection and Testing		
	37.4 Rejection		
	37.5 Independent Inspection		
	38.1 Examination of Work before Covering up		
	38.2 Uncovering and Making Openings		
	39.1 Removal of Improper Work, Materials or Plant		
	39.2 Default of Contractor in Compliance		
	Suspension		
	40.1 Suspension of Work		
	40.2 Engineer's Determination following Suspension		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	General Conditions (Cont.)		
	Commencement and Delays		
	40.3 Suspension lasting more than 84 Days		
	41.1 Commencement of Works		
	42.1 Possession of Site and Access Thereto		
	42.2 Failure to Give Possession		
	42.3 Rights of Way and Facilities		
	43.1 Time for Completion		
	44.1 Extension of Time for Completion		
	44.2 Contractor to Provide Notification and Detailed Particulars		
	44.3 Interim Determination of Extension		
	45.1 Restriction on Working Hours		
	46.1 Rate of Progress		
	47.1 Liquidated Damages for Delay		
	47.2 Reduction of Liquidated Damages		
	48.1 Taking-Over Certificate		
	48.2 Taking-Over of Sections or Parts		
	48.3 Substantial Completion of Parts		
	48.4 Surfaces Requiring Reinstatement		
	Defects Liability		
	49.1 Defects Liability Period		
	49.2 Completion of Outstanding Work and Remedying Defects		
	49.3 Cost of Remedying Defects		
	49.4 Contractor's Failure to Carry Out Instructions		
	50.1 Contractor to Search		
	Alterations, Additions and Omissions		
	51.1 Variations		
	51.2 Instructions for Variations		
	52.1 Valuation of Variations		
	52.2 Power of Engineer to Fix Rates		
	52.3 Variations Exceeding 15 percent		
	52.4 Daywork		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Procedure for claims		
	53.1 Notice of Claims		
	53.2 Contemporary Records		
	53.3 Substantiation of Claims		
	53.4 Failure to Comply		
	53.5 Payment of Claims		
	Contractor's Equipment, Temporary Works and Materials		
	54.1 Contractor's Equipment, Temporary Works and Materials Exclusive; Use for the Works		
	54.2 Employer not Liable for Damage		
	54.3 Customs Clearance		
	54.4 Re-export of Contractor's Equipment		
	54.5 Conditions of Hire of Contractor's Equipment		
	54.6 Costs for the Purpose of Clause 63		
	54.7 Incorporation of Clause in Subcontracts		
	54.8 Approval of Materials not Implied		
	Measurement		
	55.1 Quantities		
	56.1 Works to be Measured		
	57.1 Method of Measurement		
	57.2 Breakdown of Lump Sum Items		
	Provisional Sums		
	58.1 Definition of "Provisional Sum"		
	58.2 Use of Provisional Sums		
	583 Production of Vouchers		
	Nominated Subcontractors		
	59.1 Definition of "Nominated Subcontractors"		
	59.2 Nominated Subcontractors; Objection to Nomination		
	59.3 Design Requirements to be Expressly Stated		
	59.4 Payments to Nominated Subcontractors		
	59.5 Certification of Payments to Nominated Subcontractors		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Certificates and Payment		
	60.1 Monthly Statements		
	60.2 Monthly Payments		
	60.3 Payment of Retention Money		
	60.4 Correction of Certificates		
	60.5 Statement at Completion		
	60.6 Final Statement		
	60.7 Discharge		
	60.8 Final Payment Certificate		
	60.9 Cessation of Employer's Liability		
	60.10 Time for Payment		
	61.1 Approval only by Defects Liability Certificate		
	62.1 Defects Liability Certificate		
	62.2 Unfulfilled Obligations		
	Remedies		
	63.1 Default of Contractor		
	63.2 Valuation at Date of Termination		
	63.3 Payment after Termination		
	63.4 Assignment of Benefit of Agreement		
	64.1 Urgent Remedial Work		
	Special Risks		
	65.1 No Liability for Special Risks		
	65.2 Special Risks		
	65.3 Damage to Works by Special Risks		
	65.4 Projectile, Missile		
	65.5 Increased Costs arising from Special Risks		
	65.6 Outbreak of War		
	65.7 Removal of Contractor's Equipment on Termination		
	65.8 Payment if Contract Terminated		
	Release from Performance		
	66.1 Payment in Event of Release from Performance		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Default of Employer		
	69.1 Default of Employer		
	69.2 Removal of Contractor's Equipment		
	69.3 Payment on Termination		
	69.4 Contractor's Entitlement to Suspend Work		
	69.5 Resumption of Work		
	Changes in Cost and Legislation		
	70.1 Increase or Decrease of Cost		
	70.2 Subsequent Legislation		
	Currency and Rates of Exchange		
	71.1 Currency Restrictions		
	72.1 Rates of Exchange		
	72.2 Currency Proportions		
	72.3 Currencies of Payment for Provisional Sums		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	PART II : CONDITIONS OF PARTICULAR APPLICATION		
	Clause No.		
	1.1 & 1.2 **Definitions**		
	2.3 Engineer's Authority to delegate		
	5.1 Languages and law		
	5.2 Priority of Contract Documents		
	10.1 Performance Security		
	14.1 Programme to be submitted		
	14.3 Cash flow estimate to be submitted		
	15.2 Contractor's Superintendence		
	16.3 Language ability of Superintending Staff		
	16.4 Employment of Local Personnel		
	21.2 Scope of Cover		
	23.2 Minimum amount of Insurance		
	24.2 Insurance against accident to workmen		
	34.2 Rates of Wages and Conditions of Labour		
	34.3 Certificate of Compliance with Conditions of Clause		
	34.4 Trade Union Membership		
	34.6 Employment of persons in the service of others		
	34.7 Repatriation of labour		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	34.8 Housing for labour		
	34.9 Accident Prevention Officer; Accidents		
	34.10 Health and Safety		
	34.11 Measures against Insect and Pest Nuisance		
	34.12 Epidemics		
	34.13 Burial of the dead		
	34.14 Supply of water		
	34.15 Alcoholic liquor or drugs		
	34.16 Arms and Ammunition		
	34.17 Festivals and Religious Customs		
	34.18 Disorderly conduct		
	43.1 Time for completion		
	44.1 Extension of time for completion		
	47.1 Liquidated damages for delay		
	52.3 Variations exceeding 15 percent		
	57.1 Method of Measurement		
	58.1 Definitions of Provisional Sum		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description		Amount Rs.	Cs
	60.11	Advance Payment		
	67.3	Arbitration		
	68.2	Notices to Employer and Engineer		
	70.1 & 70.2	Increase or Decrease of Cost		
	71	Currency Restrictions Rates of exchange		
	72	Rates of Exchange		
	73	Taxation		
	74	Non-liability personal		
	75.1	Regulations and Immigration Laws		
	76.1 to 76.4	Fraud and Corruption		
	77.1	Joint and Several Liability		
		Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	The Appendix to Conditions of Contract will be as follows:-		

	Clause	
Amount of Performance Security	10.1	**Ten per cent** of the Contract Price
Minimum amount of Insurance Including Employer's Representatives	23.1 & 23.2	**MUR 10.00 million** – for any occurrence or Series of occurrence arising out of any event
Value and content of Building For insurance purposes	23.1	**MUR 6.00 million**
Time for issue of notice to commence	41.1	Fourteen (14) days
Time for completion (overall completion)	43.1	**183 Calendar days**
Amount of liquidated damages Limit of Liquidated damages	47.1	6,000 per calendar day 5% of the contract price
Defects Liability Period	49.1	**365 Calendar days**
Percentage of invoice value Value of listed materials and Plant	60.1 (c)	**100% per cent**
Percentage of Retention	60.2	**Ten per Cent**
Limit of Retention Money	60.2	**Ten per cent**
Minimum Amount of Interim Payment Certificates	60.2	**MUR 200,000**
Rate of interest upon unpaid sums	60.10	**At Prevailing Bank Rate**
Advance Payment	60.11	10 % of Contract Price less Contingencies

Signature of Tenderer .....

	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	SPECIFICATION AND OTHER DOCUMENTS		
	Generally		
A	The Specification is bound in the Tender documents. Where the Specification contains clauses related to any of the following General Requirements, these Bills of Quantities refer to clauses in the Specification.		
B	The drawings which were used in the preparation of these Bills of Quantities are listed in the Appendix to these Bills.		
C	In order to assist Tenderers, drawings are issued with the Tender Document. The Architect's and Engineer's drawings illustrate broadly the scope of the work to be done. The Contractor will be deemed to have examined the site condition, the nature of the surrounding areas, the preservation and protection of existing underground services, drains and the like and to have ascertained their details and the nature of the works and no claim for want of knowledge will be entertained.		
D	Bills of Quantities No unauthorized alteration in any of these Bills of Quantities is to be made by the tendering Contractor. Should any alteration, amendment, note or addition be made, it will not be recognized but the reading as printed will be adhered to. In the case of the Contractor leaving unpriced any of the items in these Bills of Quantities, he will be deemed to have considered that the rates of the remaining items are sufficient to enable him to perform the services and obligations described in the items not priced without extra charge.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Bills of Quantities (Continued)		
A	The Contractor is advised that the quantities, sizes, etc., contained in these Bills of Quantities should not be used for the purpose of ordering materials without checking from the working drawings or from site, as no claim will be entertained for costs incurred in over-or-under-ordering of materials.		
B	All prices or rates inserted in these Bills of Quantities are to be fully inclusive prices or rates for the finished work described under the respective items and/or drawings, unless otherwise stated or unless there is a separate item for extra labour, cutting or waste and are to include for all materials, making, conveying, cartage, carriage and delivery, unloading, storing, unpacking, hoisting or conveying, setting, fixing, and building into position and labour of every description, cutting and waste, templates, patterns and models, plant, temporary works, return of packing, taxes, levies, custom duties, surcharges, establishment charges, overheads, costs of all nature, and all obligations arising out of the Conditions of Contract, the provisions of Materials and Workmanship bills, the provisions of the Preliminaries bills and the execution of the relevant work. Prices for plant, temporary works, services and other items provided shall include for the supply, maintenance, fuel, operating costs and subsequent removal and making good as necessary.		
C	The prices for all items shall where applicable include for all small quantities, short lengths and narrow widths, Where items are described as "Fix only" this shall be deemed to mean delivered on site but Contractors shall be responsible for, unloading on site, storing, unpacking, distributing to the required position on site, assembling and fixing, and returning packing cases to consignor if required.		
D	The Contractor shall be held solely responsible for and shall, at his own expense, rectify any errors arising out of incorrect interpretation of the Drawings, Specifications, Bills of Quantities or instructions.		
E	The Contractor shall note that no claims whatsoever will be allowed in respect .of errors or omissions in pricing due to brevity of descriptions of items in the Bills of Quantities which are fully described when read in conjunction with the relevant requirements of the Bill of General requirements and Specifications and/or the Conditions of Contract and/or drawings.		
F	All descriptions of items (i.e. description associated with units and quantities) shall be deemed to be read in conjunction with their respective general headings and all levels of descriptions and headings are to be taken as mutually explanatory of one another.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Pricing of Temporary Works		
A	Notwithstanding Clauses 55, 56 and 57 of the Conditions of Contract and anything contained in the Tender Documents, Lump Sum items shall be deemed to be priced on a "Lump Sum" basis to comply with the requirements of the contract and no adjustment will be made to the Contract Price irrespective of the scope and/or nature of the Temporary Works executed by the Contractor.		
	Shop Drawings		
B	The term "**shop drawings**" shall mean drawings, diagrams, schedules, performance charts, brochures, operating manuals and other data which are prepared by the Contractor or any Sub-contractor, manufacturer or supplier and which illustrate some portion of the work.		
C	The Contractor shall prepare, at his own expense, and shall submit two copies of shop drawings of all fabricated work, working or setting out drawings, shop details and schedules of Mechanical, Electrical and Plumbing drawings to the Engineer for approval. The Engineer will require a minimum of 7 working days for approval of the shop drawing. Contractor must ensure shop drawings, samples, technical literature are duly submitted, in conformity with contract specification, stating the item of the Bills of Quantities/Specifications for which samples and shop drawings are submitted for approval. Such work shall not be executed by the Contractor until approved.		
D	The Contractor shall present a complete schedule showing submission dates, for all trades and the scheduled dates, for approval of all drawings. The Contractor shall note that the Engineer and the Engineer's Representative require two weeks for checking from the date of the receipt of all shop drawings.		
E	All submissions shall be on dates as indicated in the above schedule and sufficiently in advance as no claim for extension to the contract time will be granted to the Contractor by reason of his failure in this respect.		
F	The Contractor shall submit two copies of catalogues and data for approval. The Contractor shall check all submissions for conformity with the contract drawings and specifications and correct any errors, omissions or deviations before forwarding to the Engineer.		
G	The Engineer 's approval of any document or drawing does not in any way vary the Engineer's contractual obligations and liabilities to the owner or any other party, nor does it vary the contractual obligations and liabilities of the party submitting such document or drawing for approval.		
H	Corrections of shop drawings by the Engineer shall not change the scope of work. Should any such correction constitute a change of scope of work, the Contractor shall notify the Engineer in writing within not more than seven calendar days of such change and shall not proceed with the fabrication until so authorized by the Engineer.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Provisional Sums and Prime Cost Items		
A	The words "**Provisional Sums**", "Prime Cost" or the initial "**P.C**" is applied in the Bills of Quantities to works which are required to be carried out by a Nominated Sub-Contractor or to Goods or Materials which are required to be obtained from a Nominated Supplier and shall mean, unless otherwise stated in the said Bills of Quantities the net sum paid to the Nominated Sub-Contractor or Supplier after deducting all trade or other discounts for such goods. Such sums do not include the Contractor's profit and overhead charges, fixing or attendances.		
B	Nominated Sub-contractor, the Supplier or Sub-contractors shall be made responsible for any loss, damage or breakage and shall replace lost or damaged materials or goods at his own expense until ownership passes to the Contractor or the Employer from which the Contractor will be responsible.		
C	The Contractor will be required to sign a receipt for all P.C. articles at the time of taking delivery thereof, as having received them in good order and condition. He will take delivery on site or as otherwise directed and will be required to load, transport to site, offload and provide safe storage and thereafter be responsible for any loss or damage and for replacement of any such loss or damage with materials to the satisfaction of the Engineer at his own cost and expense.		
D	The Contractor shall also ensure that all Nominated Sub-contractors and Nominated Suppliers if any, warrant the Contractor that any such materials or goods and any subcontract works conform to the quality and standard specified.		
E	Where the work of Sub-contractors or Suppliers is subject to approval of drawings, details, calculations, etc., the Contractor shall take all necessary steps to ensure that they are submitted for approval in good time, so that there will be no delay in the execution of the Works.		
F	The Contractor's attendance on Sub-contractors shall be deemed to include for subcontractor's use of Temporary Works and facilities as per the FIDIC Conditions of Subcontract, if any and for also arranging with any Authority, public undertakings, nominated Sub-contractors and nominated suppliers at the time for commencement of their work on the site or manufacture and delivery of their goods and materials as appropriate, obtaining from them particulars of holes, mortises, chases, recesses, fixings and the like and supplying them with all dimensions and other information required for the proper execution of the Works. Before accepting any estimate in respect of materials or goods to be delivered to site by a nominated supplier or in respect of work to be executed by a nominated Sub-contractor, the Contractor must ensure that the conditions of the estimate conform with the conditions of the main contract and that the materials or goods can be delivered or work can be executed so as not to conflict with the Contractor's work programme.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Direct Contractors		
A	The Employer will employ his own direct Contractors where applicable to execute any special or other works whether contained in this Contract or not concurrently with the work being executed under this Contract. The Employer shall have the right to send on to the Works any fittings and equipment to be installed by his own employees or by direct Contractors. The Contractor shall not be entitled to any percentage, profit or discount on the value of any work executed by "direct Contractors" but shall nevertheless allow these direct Contractors and the Employer's employees to have access to the Works, allocate reasonable space in the building for the storage of their materials, tools and equipment, and co-ordinate the work of and provide attendance upon direct Contractors as necessary, all to the satisfaction of the Engineer. The Contractor shall provide all necessary facilities such as water and power supply on the site, and shall not in any way hinder or prevent the execution of their work.		
B	The Contractor is to allow herein for any costs in connection with attendance (as described for Nominated Sub-contractors) upon such Direct Contractors etc.. and for the use of the facilities stated above and no additional claim will be entertained due to the presence on the Works of such direct Contractors. Should the Contractor be required to make good after such direct Contractors or for any builder's work the Contractor will be paid on the basis of rates previously agreed in accordance with the Contract.		
	Dayworks		
D	Variations including variations to Sub Contractor's work will be valued on a day work basis only if so authorized in writing by the Engineer. The Contractor must present a full detailed account of labour and materials expended in the execution of day work variations which must be signed by the Engineer before the end of the week following that in which the work was executed, failing which the claims will be disallowed.		
E	Notwithstanding anything which is or may be stated to the contrary, the signature of the Engineer or any other consultant shall only indicate that the work has been carried out but shall not indicate acceptance of quantum, value or method of valuation of work executed thereunder nor shall such signature indicate acceptance that such work constitutes a variation. The quantum of this work and the method of valuation of same will be decided by the Engineer.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Final Account		
A	The Contractor shall be obliged timeously to do everything necessary and to provide all information required by the Engineer for the purpose of enabling the Engineer to compile the Final Account. The Contractor shall be obliged within 45 days after receipt of this Final Account prepared by the Engineer signify his acceptance of same or to advance any claims he may have in respect thereof for the consideration of the Engineer. Failing such further claims in writing 45 days of receipt of the said Final Account in its entirety by the Contractor, it shall be deemed that the Contractor has accepted the Final Account and no further claims in connection with the works will be entertained.		
	OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER		
	Temporary Hoardings and Safety Net		
B	Contractor shall allow adequate temporary hoarding both outside and inside the building for safe access to Employer's staff. The Contractor shall also allow for safety net and security net, including dust mitigation, hoarding like charlon, from the start of the work till completion of security of the Employer's personnel and in line with the Health and Safety requirement.		
	Access to Site		
C	The Contractor is to agree the points of access and egress with the Engineer and all Authorities concerned and is to include here or in his prices for building any temporary access roads, crossings, cross over or other means of gaining access to the site and make good and reinstate to the entire satisfaction of the Engineer all works disturbed.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Site to be tidy		
A	The site shall be maintained in a neat, tidy and healthy condition and the Contractor shall remove all surplus excavated spoil, waste and unwanted materials, debris and other litter from the site from day to day or as directed by the Engineer and in compliance with the requirement of Ministry of Environment.		
	Master Programme		
B	The Contractor is to prepare and submit to the Engineer within 28 days from the issue of the letter of Acceptance five copies of the master programme. The programme shall include the planned monthly rates of progress between the programmed date for commencement and completion for all items of work for various stages of construction and for item under PC and Provisional Sums including dates by which major drawings requiring approval will be submitted. The programme shall be in the form of a time and progress chart or a critical path network and shall also show a weekly schedule of labour and plant resources to be employed for each item of work of the programme.		
C	The Programme must also take into account the requirements of all major Sub-contractors, and persons employed or engaged upon the Works. The Contractor shall also submit short term monthly or weekly programmes as and when required by the Engineer.		
D	The Programme shall reflect the agreed completion date of the Works as set out in the Contract and shall indicate anticipated starting and completion dates for the various trades and Sub-contracts and the various sections of the Works.		
E	The Contractor shall ensure that the work is carried out and controlled in such a way that the Contract is completed by the completion date. Where Acceleration measures are required by the Engineer to make up for delays for which the Contractor is entitled to an extension of time as certified by the Engineer in terms of Clause 44 hereof, then such measures are to be approved by the Engineer before the execution thereof. In the event that delays occur for which the Contractor would not become entitled to an extension of time in terms of Clause 44 hereof, the Contractor shall take all necessary steps to ensure that the Contract is completed timorously including the provision by him of additional resources, plant, labour, etc., and the working of overtime and by all other adequate and proper means and methods.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Information required for Construction		
A	The Contractor shall within 28 days of instructions to commence, submit a proposed "Schedule of Information Required" indicating latest dates by which instructions, drawings and other information are required from the Engineer including instructions in connection with the nomination of suppliers and Sub-Contractors to enable him to comply with the programme.		
B	The schedule shall be related to the programme of works and shall not contain any requirements which are in the opinion of the Engineer unreasonable or premature and shall be updated as necessary during the construction period.		
	Protection of streams, canals and sea		
C	Provide for taking all precautions to ensure the efficient protection of all streams, canals and sea against pollution arising out of or by reasons of the execution of the works.		
	Area of operations		
D	Provide for taking reasonable precautions to prevent workpeople, including those employed by Sub-contractors from encroaching or trespassing upon any part of the site or premises which are not affected by the Works and from trespassing upon adjoining and existing owner's property except where permission be granted to facilitate the carrying out of the Works.:		
E	The Contractor shall be required to limit the construction activity, temporary buildings, storage or equipment and materials etc. within the boundaries of the area allocated to him.		
	Materials or objects of value found on site		
F	Any materials or objects of value such as buried relics and the like, including sand or gravel found on site when excavating are to remain the property of the Employer under this Contract and shall only be sold or removed as the Engineer shall direct and access shall be allowed to any authorized person instructed to remove same.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	CONTRACTORS ADMINISTRATIVE ARRANGEMENTS		
	Safety on site		
A	The Contractor shall take all necessary steps to ensure that the site is run in an orderly manner and that safety precautions are enforced to avoid accidents to the personnel of the Contractor and to other parties working on site and take all necessary measures for the safety of the public and property.		
	Contractor's Superintendent and Site Management		
B	Contractor shall provide the following technical personnel for the proper site superintendence and site management. 1) One full time site Supervisor who must be a holder of Diploma in Civil Engineering from a recognized University or similar acceptable equivalent qualification and having minimum 5 years' experience in supervising Building and Civil Engineering works, finishes and supervising quality control process on site. 2) One M&E Coordinator having a Diploma in Building Services Engineering from a recognized University or similar acceptable equivalent qualification and having minimum 5 years' experience in coordination of building engineering services, quality control and supervising MEP work. 3) One registered health and safety officer.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Contractor's Superintendent and Site Management		
A	In the event the Contractor shall not provide the Supervisor an amount of MUR 35,000 shall be deducted per month from the Contract price.		
B	In the event the Contractor shall not provide an M&E Coordinator as specified beforecv , an amount of MUR 15,000 shall be deducted per month for each position respectively from the Contract price.		
	Site Meetings		
C	The Contractor must hold such meetings as are necessary for the proper management of the Contract and the Engineer may call progress meetings from time to time. The Contractor must arrange for Sub-contractors to attend such meetings when required and should allow here for all expenses of his own attendance and for the provision of suitable accommodation.		
D	The Contractor shall hold meetings with his Sub-contractors and Suppliers in order to monitor their progress and to discuss and co-ordinate all aspects of the Contract.		
	Safeguarding the Works		
E	Safeguard the Works, materials and plant against damage or theft including providing all necessary watching and lighting for the security of the Works and the protection of the public and for the prevention of unauthorized access to adjoining and existing property from the site. Provide facilities for any security guard employed.		
	Transport for workpeople		
F	Provide for all expenses in connection with transport of workpeople to and from the site and around the site including traveling expenses and fares.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Labour on-costs		
A	Provide for all costs in respect of all workpeople but not limited to the following: (a) National Pension Contributions, training levy and contribution to Employee's welfare fund. (b) Disbursements under the Sick Payments Scheme (c) Annual and Public Holidays (d) Traveling time, subsistence expenses and fares and all other like costs. (e) Non-productive time and other expenses in connection with overtime. (f) Shutdown on account of cyclone warnings or adverse weather conditions (g) Incentive and bonus payments (h) Severance pay and obligations and workmen's compensation Insurance (i) End of year bonus (j) Protective clothing and equipment (k) Any other disbursements arising from employment of labour, including complying with the provisions of Employment's' regulations.		
	Overtime No payment will be made for any overtime incurred for the purpose of maintaining progress and for ensuring completion within the Contract period.		
	CONSTRUCTIONAL PLANT **Plant**		
B	Provide all plant and equipment necessary for the proper execution of the Works both mechanical plant and vehicles and non-mechanical plant and tools, including: - a) Backhoe Excavator 0.5 m^3 (1 no.) b) Concrete Mixer (1 no.) c) Pneumatic breaker (2 nos.) d) Vibrator and poker (3 nos.) e) Any other requisite construction equipment		
C	The Contractor shall allow for altering, adapting and maintaining all such plant as necessary and at or before completion clear away same from the building and site and make good all work disturbed.		
	Scaffolding		
D	Provide all necessary scaffolding for the proper and efficient execution and completion of the Works by all trades including that required by Subcontractors whether nominated or otherwise.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	EMPLOYERS FACILITIES		
	Temporary accommodation required by the Employer		
A	Provide suitable office accommodation for the sole use of the Architect or the Employer's Consultants, maintain throughout the duration of the Contract and clear away on completion and make good.		
	The site office is to be not less than 25 square meters in floor area and clear headroom not less than 2.90 m, to Engineer's approval for holding meetings and shall be equipped with minimum a meeting table and chairs for about of 10 persons and for other site works on regular basis. The whole of site office shall be fully air conditioned. The site office shall be located adjacent to site plot, as approved by the Engineer, shall be for the sole use of the Engineer and his representative.		
	Dumpy level in proper working order is to be provided on request for the use of the Engineer or his representative.		
	Site signboard		
B	Provide and erect one no. site signboards size 2.40 m wide x 2.40 m long set 2.00 m above ground as approved by the Engineer to show the title of the Works and the name and address of Employer, Project Manager, Architect, Quantity Surveyor, Civil and Structural Engineer and if so desired of the Contractor and Subcontractors all in accordance with a drawing to be supplied by the Engineer.		
	Allow for obtaining all necessary consents or licenses from the Local Authority and on completion of the Works dismantle, clear away and make good.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	CONTRACTORS FACILITIES		
	Use of existing services		
A	The Contractor will not be permitted to make connection to the existing water or electricity supply. They will have to make arrangement with the relevant authorities for water and electricity sources. They will however be able to use existing toilet facilities.		
	Water for the Works		
B	The Contractor shall be allowed to tap in Employer's water supply for the purpose of the project. Contractor shall allow for all connection therewith, and provide all temporary storage, distribution pipes and plumbing etc. and shall remove same and make good surfaces disturbed to the satisfaction of the Engineer and pay all charges in connection therewith based on Contractor's meter installed in the network, as approved by the Engineer. The Employer will not be liable for any short supply of water.		
	Lighting and power for the Works		
C	Contractor shall be allowed to tap off the artificial lighting and power for use on the Works, pay all charges in connection therewith to the Employer the cost and charges based on meter installed by the Contractor, to Engineer's approval. The Contractor shall also provide all necessary connection, switchgear, fuses, distribution boards and all necessary arrangements and equipment for distribution about the site. The Contractor shall alter, adapt, remove and make good on completion. Notwithstanding the power supply by the Employer, the latter does not does not guarantee the adequacy of the power for the construction work and also for testing and commissioning of the work. The Contractor shall arrange in their cost for any short supply.		
	Temporary roads		
D	The Contractor shall use access to the site as directed by the Engineer and shall provide and maintain all necessary temporary roads, hard standings, crossings, footways and the like on site. Any damage done to existing site conditions by the Contractor or his Sub-contractors must be reinstated and made good to the satisfaction of the Engineer, at the Contractor's own expense.		
	Temporary toilet facilities		
E	The Contractor shall be permitted to make use of Employer's toilet facilities for all work people employed under this contract including sub-contractors. The Contractor must ensure Employer's toilet facilities are kept clean and tidy.		
	Temporary Telephone		
F	Allow for the provision of a temporary telephone service for the Contractor's own use and that of sub-contractors and pay all charges and expenses. The Contractor should make his own arrangement for the recovery of the cost of any calls made by sub-contractors or others.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	SUNDRY AND GENERAL ITEMS		
	Protecting the Works		
A	The Contractor shall be entirely responsible for the security of all the works, stores, materials, plant, personnel, etc., both his own and Sub- contractors' and shall provide necessary watching, lighting, barriers, hoardings and other precautions necessary to ensure the security and the protection of the public. He shall take all possible precautions to prevent any nuisance, inconvenience or injury to the holder or occupiers of surrounding properties and shall at all times keep all paths and roads affected by the Works in a safe and clear state and shall use proper precautions to ensure the safety of all wheeled traffic and pedestrians.		
B	The Contractor will be held entirely responsible for the adequacy of the covering and protection afforded against damage by adverse weather or otherwise and he shall make good any such damage at his own expense. He shall suspend all operations during such weather conditions, which in the opinion of the Architect would be detrimental to the works.		
	Protection of public and private drains and Services		
C	Protect, uphold and maintain all existing public and private live drainage, water, and other mains or ducts, power services, overhead cables etc., whether on or off the site, during the execution of the Works. Before commencing the Works, the Contractor must ascertain from the various public and private owners or statutory authorities the position of all known drains and services etc., and in the event of damage to same caused by the Works, he must arrange for such damage to be made good at his own expense or pay any charges or costs in connection therewith.		
D	The Contractor must allow all necessary protection of existing underground sewer line, including chambers crossing the site till completion of the work to Engineer's satisfaction.		
	Traffic regulations		
E	Allow for complying with any police regulations, or requirements concerning pedestrian or vehicular traffic control, site access and egress, safety precautions and other matters affecting the Works.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Statutes and Government regulations		
A	Provide for all costs incurred by complying with all safety, Health and Welfare Acts etc., and other current statutes, Regulations and Industrial Agreements applicable to the construction industry.		
B	The Contractor will be required to satisfy the Engineer at regular intervals that all necessary precautions have been and are being taken to secure the health, safety and welfare of all persons upon the site (whether in his employment or otherwise) and to protect all persons against risks to health or safety arising out of or in connection the activities of persons at work on the site of the Works and will be required to introduce such safety measures as Engineer may determine are necessary to comply with regulations currently in force.		
C	Nothing in these clauses shall be constructed as in any way relieving the Contractor of his obligations at law to comply with current legislation		
	Maintenance of roads and services		
D	Maintain public and private roads, footpaths, Kerbs, etc., and keep the approaches to the site clear of mud, other debris and the like. The Contractor is to make good any damage caused by his own or any Sub-contractor's or Supplier's transport at his own expense or pay all costs and charges in connection therewith. The Contractor shall protect, uphold, and maintain all pipes, sewers, water mains, overhead cables and services etc. during the execution of the work and is to make good any damage caused or pay any costs and charges in connection therewith.		
	Removing rubbish and cleaning the works		
E	Provide for removing all protective casings and coverings and removing all rubbish from the site as it accumulates from day to day and from time to time and, on completion, clean the buildings inside and out, including thoroughly cleaning all floors and paving, easing and adjusting all doors, ventilators, casements etc., cutting out all cracks and blisters in plasterwork and repairing, removing stains and touching up paintwork or polished work, oiling and adjusting all ironmongery, window fittings etc., cutting out broken glass and replacing with new, cleaning all glass inside and out and leaving the whole of the Works clean and tidy to the satisfaction of the Engineer on completion.		
	Testing Charges		
F	The Contractor shall allow for all tests as specified in the Contract including test of all materials, concrete test cubes, the production and provision of samples of materials, workmanship and the like as required by the Engineer. The Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Advertisements and notices		
A	No advertisements will be permitted on the fencing, hoardings or any other part of the Works and Contractor shall not erect or allow any other persons to erect any sign, notice, display or advertisement of any kind on any part of the site buildings or hoardings, unless authorized in writing by the Engineer and he shall remove any such unauthorized advertisement immediately he is called upon to do so.		
	Samples		
B	The Contractor shall allow herein for all costs incurred in connection with the provision of samples and mock-ups of any material, workmanship or building components. The Engineer shall have the right to reject any materials or workmanship not in conformity with the approved samples.		
	Nuisance		
C	The Contractor shall take all proper precautions for the prevention of nuisance, inconvenience etc. to adjoining property or persons and shall allow for the work to be carried out at such times and in such order as not to cause any nuisance or inconvenience		
	Opening up of work		
D	The Contractor shall, at the request of the Engineer within such time as the Engineer shall name, open for inspection any work covered up; and should the Contractor refuse or neglect to comply, the Employer may employ workmen other than those employed by the Contractor to open up the same. If the said work has been covered up in contravention of the Engineer's instructions, the expenses of opening and covering it up against, whether done by the contractor or by the Engineer shall be borne by and be recoverable from the Contractor or may be deducted from any monies due to the Contractor. Provided always that in the case foundations or of any other urgent work so opened up and requiring immediate attention the Engineer shall within a reasonable time after receipt of notice from the Contractor that the work has been so opened, make or cause to be made the inspection thereof.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Saving Clause		
A	If any clause, stipulation or provision contained in any contract document shall be wholly or partially repeated in the same document or contained in these conditions or in the Contract Agreement and also on the Drawings., the Engineer may at his option adopt either of such clauses, stipulations or provisions.		
	Contractor to do everything necessary		
B	The Contractor shall allow opposite this item or in the prices/rates throughout these Bills Quantities for working all overtime, weekends, public holiday etc., and for doing everything necessary to complete the Works and the individual sections thereof by the stipulated dates		
	Checking of drawings		
C	Upon receipt of details drawings for any work, the Contractor shall, before putting that work in hand, he must check and ensure that there is no discrepancy between various Consultants' drawings. In case of any discrepancy between the drawings and or with the work already completed, the Contractor must seek clarification from the Engineer before proceeding with the work. The Contractor must also ascertain that the dimensions given on the detail drawings correspond with the dimensions of any work already built and which governs the sizes of any work for which details are now issued. In the event of the detail drawings not agreeing with the works already built, the discrepancy shall be brought to the Engineer's attention and the detail drawings shall be returned at once for alteration		
	Figured Dimensions		
D	All dimensions will be figured on the drawings or may be calculated from figured dimensions and are always to be followed. No dimensions shall be obtained by scaling. Dimensions where possible are to be taken from the building. The Contractor shall check all dimensions on any drawing before putting any work in hand.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Builder's work		
A	The Contractor is to obtain all necessary particulars from all Subcontractors as to recesses, chases, sleeves, etc., required so that they may be correctly built in, in the first place. If the Contractor fails to do this, the cost of any alterations or cutting will fall upon him.		
	Co-ordination		
B	The Contractor shall co-ordinate the work of all Sub-contractor's tradesmen, workmen and others engaged on the Works and shall liaise and co-ordinate with all parties to ensure the smooth and orderly progress of construction, the closest co-operation between all the parties concerned and the timeously completion of the Contract. The Contractor shall liaise with all suppliers and manufacturers to ensure the timorous delivery of all materials required for the Works.		
	Maintenance Manuals		
C	The Contractor shall obtain and hand over to the Engineer on practical completion any operating and maintenance instruction manuals, data or instructions required by the Engineer or provided by Manufacturers, Suppliers or Sub-contractors.		
	Ordering of materials		
D	Delay in the delivery of materials or in the obtcntion of the necessary permits, certificate, licenses by the Contractor shall not justify any extension of time. Should the Contractor consider that he will be unable to obtain materials including imported materials, for any item or items described in the Bills of Quantities or to obtain such materials in time to suit the programme of the works or to obtain such material in the specified sizes or the stated specification, he is to report this in writing to the Engineer before the closing date for tenders and shall obtain the Engineer's written directives in connection therewith. If the Contractor fails to do this his tender will be taken as firm for all items described in the Bills of Quantities and he will be responsible for supplying such materials timorously to meet the programme for the works.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Quality Control and Quality Assurance Procedures		
A	In compliance with Clause 36.1 of the Conditions of Contract, the Contractor shall be required to provide quality control and quality assurance.		
	Definitions		
B	The following definitions are applicable: (a) Quality Assurance is the organized evaluation of quality control systems and their implementation to provide increased, confidence in the quality of a product or service. (b) Quality Control is the implementation of a set of techniques to provide increased confidence that the desire quality is being maintained.		
C	The Contractor shall submit a comprehensive **QUALITY CONTROL** proposals within **14 days** from date of commencement of works. The **QUALITY CONTROL SYSTEMS** shall be drawn up to meet the requirements set out herein and incorporating all additional requirements and controls the Contractor considers necessary for effective control and assurance of a high quality of workmanship. The Contractor shall provide dedicated and experienced staff capable of implementing the proposed **QUALITY CONTROL SYSTEM**. The Engineer shall comment on the **QUALITY CONTROL SYSTEM** within 14 days from the date of submission outlining additions or amendments considered necessary for acceptance of the **QUALITY CONTROL SYSTEM**. The Contractor shall meet with the Engineer and amend the contents of the **QUALITY CONTROL SYSTEM** according to the Engineer's comments. Amendments to the system shall be made within seven days of the Engineer's comments. The Contractor will not be able to proceed with any work on the Project until written approval of the system has been issued by the Engineer. The acceptance of the **QUALITY CONTROL SYSTEM** by the Engineer does not supersede or negate any other quality control conditions stipulated elsewhere in the contract documentation and in the instance of contradiction of requirements being identified specific requirements shall override general requirements. Acceptance of the system by the Engineer shall not in any way supersede, negate or alter the intent, content or interpretation of the specifications or conditions of the contract specified elsewhere in the contract documentation. Acceptance of the system by the Engineer does not in any way relieve the Contractor of his responsibility to satisfy the conditions of contract and to achieve the specified standards. The **QUALITY CONTROL SYSTEM** is an audit procedure and does not necessarily describe the Contractor's total responsibility in terms of quality control.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
A	The Engineer may from time to time call for the **QUALITY CONTROL** data sheets for random checking of: • the manner in which the system is being administrated. • the technical acceptability of the contents of the sheets, and • the effectiveness of the system in controlling the attainment of the required end product		
B	If the system is found to be inadequate or ineffective, the Engineer will have the right to declare the system or parts thereof as being areas of "non-performance". In the event of the Engineer instructing the Contractor by an Engineer's instruction of an area of "non-performance" the following options may be implemented by the Engineer at no additional cost to the Client and without any claim for delays.		
C	The structure of approvals may be altered necessitating the signature of **QUALITY CONTROL** data sheets by designated members of the professional team before work of a particular nature and/or in a particular area can proceed through the various check stages of the system. The structure of the system may be altered by extending the detail of checking required by the system and/or the frequency at which check sheets have to be produced.		
D	The geographical boundaries of a typical checking operation may be altered thereby requiring the Contractor to perform more comprehensive checks on smaller portions of work.		
E	The Contractor shall react immediately to an instruction by the Engineer regarding any alteration to the procedure of the system. On receipt of a Site Instruction on any "non-performance" from the Engineer the Contractor shall not proceed with any of the affected work until acceptance of the revised procedures has been obtained from the Engineer. Once the Engineer is satisfied that the revised **QUALITY CONTROL** procedures arc effective, the Contractor will be informed by means of an official Engineer's Instruction of the extent to which the system may revert back to the principle of "Management by Exception". It is envisaged that the system should generally operate on such a basis and providing the results are satisfactory, the Contractor is not expected to attain approval of counter-signature of every **QUALITY CONTROL** data sheet.		
F	In instances where up front inspection is an industry norm (e.g. inspection of reinforcing by the structural engineer) or where the specification demands such inspection, the Contractor must take this into account when compiling the **QUALITY CONTROL SYSTEM**.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	Site records and samples		
A	The Contractor must allow for • keeping and providing records of all defective works and other works to be undertaken class by class, observations, site tests and laboratory tests on materials or sections of the work as directed. • all samples, site observations, site tests, laboratory tests and analyses as directed. • providing reports site diaries and returns as directed. • providing progress photographs as directed. • providing samples of Architectural and Engineering components as directed. • preparing of a detailed methodology for each type of repair works with checklist for each stage of work duly signed by Contractor's Engineer, or Technicians.		
	Bar Bending Schedule		
B	The Contractor must allow for the cost for providing approval bar bending schedule, duly signed by the Structural Engineer and with all weights of reinforcement computed. The Contractor is informed that Interim Valuations and Final Account shall be made on the basis of approved bending schedule.		
	Construction Photographs/Contractor's Progress of Work		
C	The Contractor must allow for the costs of construction photographs, minimum 10 nos., on a fortnightly basis, of size 100 x 150 mm and to reflect the progress of the work on site. (Construction period), in printed copy and as well as in electronic version.		
D	Contractor need also to submit 6 copies of Contractor's progress of work, format as approved by the Engineer.		
	Amount carried to Collection		

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description	Amount Rs.	Cs
	BILL NO 1 – PRELIMINARIES AND GENERAL REQUIREMENTS		
	COLLECTION		
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	Carried to Main Summary		

BILL NO 2

SEED STORE

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION A - SUBSTRUCTURE					
	SUBSTRUCTURE **(ALL QUANTITIES PROVISIONAL)**					
	Excavation and Earthworks					
	Excavation in any type of material including tarred surfaces, rock, hard materials, as described and including bedrock and the like.					
	Excavation starting from reduced/formation level					
	In trenches and pits to receive footing, column bases and the like					
A	Depth not exceeding 1.50 m	m^3	200			
	Disposal					
	Excavated Material					
	Selected, containing no stones exceeding 100 mm gauge, backfilling and compacting in layers 225 mm, as described					
B	Backfilling to excavations	m^3	52			
C	Removing surplus from site	m^3	148			
	Filling					
D	Imported soil as engineering fill laid as subgrade and compacted 300mm thick to Engineer's approval	m^3	193			
	Hardcore filling consisting of hard stone and or spalls not exceeding 100 mm in size depositing and compacting in layers not exceeding 300 mm thick in filling and finish graded to receive crusher run (m/s) to Engineer's approval.					
E	To make up level	m^3	51			
	Crusher run, Grade 0/50, depositing, handpacking, watering and compacting in layers n.e 150 mm thick to Engineers approval in					
F	Filling to make up levels under floors	m^3	26			
	BILL NO 2 - SEED STORE SECTION A - SUBSTRUCTURE	2.1	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Surface treatments					
	Levelling and compacting bottom of excavations, reduce level including any necessary trimming in any material					
A	Bottom of excavations and formation/reduce level	m^2	135			
	0.23 mm thick polythene sheeting 150 mm laps both ways laid to rocksand unless otherwise specified to receive concrete (measured nett - no allowance for laps.)					
C	Under floor bed	m^2	168			
	Saturate with an approved anti-termite treatment undertaken by approved specialist having a minimum of ten years warranty					
D	Top of ground or filling under floors	m^2	168			
E	Perimeter of building	m	72			
F	Allow for keeping all excavations free from all water, mud and the like by pumping, bailing or other means including the provision of all necessary pumps, temporary plumbing, etc.	Item				
G	Temporary earthwork support to sides of all excavations	Item				

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	CONCRETE WORK					
	Plain in-situ concrete designed mix Grade 20 N/mm² 20 mm aggregate, as described in					
A	50 mm thick blinding layer under footing, bases, and the like	m³	7			
	Reinforced concrete work in-situ concrete, design mix Grade 30 N/mm², 20mm aggregate vibrated as described in					
B	Foundations in trenches cast against faces of excavation	m³	32			
C	Column bases cast against faces of excavations	m³	9			
D	Surface bed 200 mm thick including thickenning of slab	m³	37			
E	Column including tie column	m³	4			
F	Ground beam and downstand beam	m³	3			
G	RC wall	m³	39			
	Formwork					
	Sawn Formwork finish as described, strutting at / from any level and including rebates and grooves formers as described to					
H	Sides of Columns	m²	37			
I	Sides of ground beam and downstand	m²	22			
J	Sides of RC wall	m²	382			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Reinforcement					
	Reinforcement bars to MS 10/ BS 4449 hot rolled plain round mild steel, as described					
A	Bars of various diameter	kg	1510			
	Reinforcement bars to MS 10/ BS 4449 hot rolled deformed high yield steel, as described					
	Bases, footings and the like					
B	Bars of various diameter	kg	13900			
	Fabric reinforcement to MS 34 and MS 35/BS 4483 and is to be laid with side and end laps as per Engineer's drawings					
C	High tensile welded mesh reference A252 weighing 3.95 kgs/m² to surface bed (measured nett, no allowance for laps.)	Kg	665			
	Expansiont Joint					
D	Allow for 5 mm thick x 40 mm saw cut joint as construction joint and filled with approved polysulphide sealant	m	118			
E	Allow for 20 mm thick compression joint, with plywood or plysterene, 200 mm wide as specified laid between concrete members/blockwalling and rake out 20 x 25 mm and filled up with approved polysulphide sealant	m	3			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Wall Finishes					
	Cement and sand (1:3) rendering as described with a smooth trowelled finish.					
A	20 mm thick to walls, columns and the like	m^2	40			
	Prepare and apply three full coats of anti fungus paint to MS 3 standard on					
B	Rendered surfaces of walls and the like.	m^2	40			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	SECTION A - SUBSTRUCTURE					
	Collection					
	Brought forward from page No	2.1				
	" " " " "	2.2				
	" " " " "	2.3				
	" " " " "	2.4				
	" " " " "	2.5				
	BILL NO 2 - SEED STORE SECTION A - SUBSTRUCTURE	2.6	Carried to Summary of Bill No 2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION B - SUPERSTRUCTURE					
	In-Situ Concrete					
	Reinforced in-situ concrete, designed mix Grade 30 N/mm², 20 mm aggregate, vibrated as described in					
A	Columns including tie columns	m³	10			
B	Beams including upstand beam and coping	m³	22			
C	Suspended slab 175 mm thick, slightly sloping	m³	40			
	Formwork					
	Sawn Formwork strutting at / from any level and including rebates or groove formers as described to					
D	Sides of columns including tie columns	m²	111			
E	Sides and soffits beams including upstand beam and coping	m²	202			
F	Soffit of suspended slab 175 mm thick, slightly sloping	m²	225			
G	Edge of suspended slab n.e. 175 mm high	m²	13			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Reinforcement					
	Reinforcement bars to BS 4449/MS 10 hot rolled plain round mild, as described (Provisional)					
A	Bars of various diameter	Kg	600			
	Reinforcement bars to BS 4449 / MS10 hot rolled high tensile steel, as described (Provisional)					
B	Bars of various diameter	Kg	11000			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - BUILDING					
	SECTION B - SUPERSTRUCTURE					
	Collection					
	Brought forward from page No	2.7				
	" " " " "	2.8				
	BILL NO 2 - SEED STORE SECTION B-SUPERSTRUCTURE	2.9	Carried to Summary of Bill No.2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION C - BLOCKWORK					
	Ground Floor to First Floor					
	Blockwalling					
	Hollow concrete blocks to BS 6073:Part I, minimum average compressive strength 3.5 N/mm² type A in cement mortar (1:3), rate shall include for waterproof treatment as per Specialist at soffit of external beam and edge of external framed columns and the like and with wall ties as specified in					
A	200 mm thick blockwalling externally	m²	295			
	BILL NO 2 - SEED STORE SECTION C - BLOCKWORK	2.10	Carried to Summary of Bill No.2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION D - ROOF COVERINGS AND RAINWATER PIPES					
	Roof Coverings					
	Cement and sand (1:3) screed as described with a smooth trowelled finish					
	Roof screed laid to falls and cross falls and to slopes					
A	40 mm (average) work to falls and cross falls to slightly sloping	m^2	221			
	Rainwater rigit PVC pipes and fittings to BS Standard including all necessary connection such as shoe, bend and the					
B	110mm diameter PVC pipe	m	26			
C	PVC shoe, bends including long bends	Nr	12			
D	Fullbora PVC grating roof outlet	Nr	4			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE **SECTION E - DOORS AND WINDOWS (As per Architect's Dwg)** Supply and install the following epoxy powder coated aluminium, to Architect's approval which shall be to BS Standard and as per manufacturer's specification and to colour to Architect's approval. Openings shall be in approved sections including all necessary mullions, transoms, beading , glazing beads with mitre cut joints and the like and glazed with a minimum of 6 mm thick clear laminated glass unless otherwise specified, to resist basic wind speed of 280 km/hr, (Contractor shall submit design calculation and shop drawings, with samples to Consultants , prior to fabrication for approval). Contractor shall ensure all openings are fixed on weathered rebated rendered jamb, lintel and cill and submit compliance certificate, prior to fixing of openings. All openings shall be epoxy powder coated finish to BS 6496, colour to Architect's approval (80 microns minimum thickness). Powder coated to be guaranteed for 10 years).openings to be pointed with silicone mastic all round internally and externally. All joints to be made weathertight with EPDM gaskets, etc. as specified by specialist. All openings shall waterjet test for watertightness to Architect's approval. Openings shall be fitted with approved lock system and 3 lever system, cremone type, rustproof aluminium hinges, minimum 1½" pair per leaf, door closer, aluminium water bar, handles, unless otherwise specified. Rate shall include for additional material required based on design implications. All ironmongeries, handles, door catch with stoppers, floor sockets for down bolts and the like shall be heavy duty Hafele type and to Architect's approval. Contractor shall submit design calculation and shop drawings, with samples to Architect, prior to fabrications, for approval. Technical literature and sample shall be submitted along with the tender. **ALUMINIUM WINDOWS**					
A	Glazed aluminium openings to suit overall structural size 1500 x 900 mm high, type W1	Nr	7			

	BILL NO 2 - SEED STORE SECTION E - DOORS AND WINDOWS	2.12	Carried to Collection		

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Powder coated automatic roller shutters Supply, install and commission of automatic roller shutters made with powder coated aluminium profiles and slats white colour to Contractor's design and to Manufacturer's specifications. Roller shutters shall be in white powder coated, minimum 80 microns and having 10 year guarantee against fading, air pockets and peeling off. Slats shall be reinforced with resin bonded fibre glass as per Manufacturer's specifications. Roller shutter shall be designed to resist cyclonic wind conditions minimum 280 Km/hr. Contractor shall submit design calculations prior to manufacture for Architect's approval. Contractor shall submit compliance certificate on powder coating of the aluminium sections and slats. Aluminium profiles and aluminium slats shall be manufactured to latest BS Standard or similar approved standards. Provision shall be made for anti wind lock and anti cyclonic bars for width over 3.00 m, all to manufacturer's specifications. Boxing shall be made of powder coated aluminium sheeting minimum 2 mm thick, bent to shape and profile, removable type and fixed with countersunk aluminium screws all to Architect's approval. Contractor shall submit 5 sets of approved shop drawings to the Consultant.					
A	Roller shutter to suit structural opening size 3500mm wide and 2500mm high	Nr	2			
B	Metal support purpose made angle 10mm high with 100mm wide plate and 6mm thick and 3.50 long and with solid mild steel fishtails laps anchored in concrete at 300mm centres.	Nr	2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - BUILDING					
	SECTION E - DOORS AND WINDOWS					
	Collection					
	Brought forward from page No	2.12				
	" " " " "	2.13				
	BILL NO 2 - SEED STORE SECTION E - DOORS AND WINDOWS	2.14	Carried to Summary Bill No 2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION F - FINISHES					
	FLOOR FINISHES Monolithic power floated finish with mechanical means with and including floor hardener at 5kg/m² as described and as					
A	To store and loading bay	m²	145			
B	Ditto to connecting platform	m²	26			
	WALL AND CEILING FINISHES Cement and sand (1:3) rendering as described, smooth trowelled finish, to internal surfaces					
	12 mm thick to					
C	Wall, columns, beams, returns, reveals and the like	m²	413			
D	Ceilings (internal)	m²	145			
	Painting Internally Prepare and apply one sealer and three full coats of matt emulsion paint with dense pigments as specified below and colour to Architect's approval to the following internal					
E	To walls, columns, beams, edge of slab, returns and the likes	m²	413			
F	Ceilings but light colours	m²	145			
	EXTERNAL FINISHES Cement and sand (1:3) rendering as described, sponge finish to external surfaces					
	20 mm thick in two coats to					
G	Wall, columns, beams, edge of slab, returns, reveals and the like	m²	484			
H	Ceilings	m²	70			
	Prepare and paint one coat of sealer and three full coats of anti-fungus paint to the following rendered surfaces externally to					
I	Wall, columns, beams, edge of slab, returns, reveals and the like	m²	484			
J	Ceilings	m²	70			
	BILL NO 2 - SEED STORE SECTION F- FINISHES	2.15	Carried to Summary Bill No 2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SECTION G - SUNDRIES					
	Catch Pit Excavate in any material including tarmac, rock and bed rock and build manholes with 150 mm thick base and 150 mm thick walls in reinforced concrete Grade 30N/mm² and rebated top edge of wall to receive angle frame bearers with cover (m/s) and internal surfaces and all exposed surfaces of concrete finish off shutter free of blemishes and base cement and sand screeded finish laid to falls and cross falls including all necessary formwork, reinforcement, holes, backfilling and the like to Engineer's approval					
A	Chamber internal size 600 x 600 mm and average depth to invert level, 450 mm deep	Nr	4			
	Covers					
B	600 x 600 mm Glynweld Brickhouse cast iron gully grating cover and frames, Class B125 to BS EN 124 or approved equivalent, medium duty	Nr	4			
	Stormwater drain Excavation of trenches width not exceeding 650 mm wide in any type of soil including rock and bed rocks and starting from reduce level for drain pipe, service pipe and the like, pipe not exceeding 160 mm internal diameter, trimming bottom of excavation to regular fall, with granular bedding to pipe, full width of trench and with 150 mm thick at base and 150 mm thick above crown of pipe and with compacted selected backfill sieved 10 mm and making up with backfilling comprising of stone not exceeding 100 mm diameter, including warning tape. Rate to include for compacting bottom of excavation to slope and carting away of surplus excavated material and all support to side of trenches. (Drain pipe m/s) For diameter pipe up to 110mm internal diameter					
C	Trenches 600mm average invert level.	m	8			
	BILL NO 2 - BUILDING SECTION G - SUNDRIES	2.16	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Pipework					
	Supply and lay the following rigid PVC pressure pipe type PN10 to BS standard and to manufacturer's specification, in trenches and connection to existing stormwater drainage					
D	110 internal diameter rigid PVC pressure pipe	m	8			
	Reinstatement of asphaltic surfaces					
A	Prepare surfaces of existing tarmac surfaces, and supply and lay 50 mm thick average asphaltic surfaces, laid to falls and crossfalls, as per Specialist with and including spraying coating, all to Engineer's approval. (Areas affected by construction work only). Contractor shall however reinstate any damage caused to existing tarmac due to their access, site facilities, storage of materials. Contractor shall allow for reinstating all areas occupied as temporary facilities to complete the contract. Contractor shall on completion clean area, make good and reinstate as required.	Sum				
	Generally					
	Work incidental to ventilation, plumbing, rainwater,drainage, fire fighting, fire alarm and electrical, telephone and concealed fixings					
B	Co-ordination with all engineering installations and marking and setting out the positions of all work	Sum				
C	Cutting or forming all holes, mortices, chases, PVC sleeves or the like and making good finishings and the like including all associated builder's work	Sum				
D	Building in or cutting and pinning brackets or the like and making good finishing	Sum				
E	Protective to painting and finishes	Sum				
	BILL NO 2 - SEED STORE SECTION G - SUNDRIES	2.17	Carried to Summary Bill No 2			

Item	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB DESCRIPTION	UNIT	QTY	RATE	AMOUNT Rs	Cs
	BILL NO 2 - BUILDING					
	SECTION G - SUNDRIES					
	Collection					
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	BILL NO 2 - SEED STORE SECTION G - SUNDRIES	2.18	Carried to Summary Bill No 2			

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 2 - SEED STORE					
	SUMMARY					
	SECTION A SUBSTRUCTURE	From	Page	2.6		
	SECTION B SUPERSTRUCTURE	From	Page	2.9		
	SECTION C BLOCKWORK	From	Page	2.10		
	SECTION D ROOF COVERINGS	From	Page	2.11		
	SECTION E DOORS AND WINDOWS	From	Page	2.14		
	SECTION F FINISHES	From	Page	2.15		
	SECTION G SUNDRIES	From	Page	2.18		
	BILL NO 2 - SEED STORE	2.19	Carried to Main Summary			

BILL NO 3

UPGRADING WORKS TO EXISTING OFFICE AT SEED STORE

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 -UPGRADING WORKS AND EXTENSION WORKS TO EXISTING SEED STORE					
	SECTION A - DEMOLITION AND ALTERATION WORKS					
	The Contractor is advised to visit the site prior to submission of the tender.					
	Demolition works in existing building comprise demolition of interior blockwalling, with attached cills and lintel but preserving existing concrete columns and beams and making good thereon to receive new work, cutting of existing structures, and the like, dismantling of components like openins, timber/glazed partition, flush doors, false ceiling all as instructed by the Engineer, including provision of all necessary shoring, supporting existing structures, making good to disturbed structures, finishes and the like to match existing finishes and to provide all necessary protection, temporary coverings, dust screens/tarpaulins, debris in order to maintain the existing building clean and tidy entirely dust and weatherproof and properly protected and removal of barriers to keep existing building other than being altered.					
	The Contractor is advised that removal of components, openings, making up openings in existing blockwalling shall be carried with all necessary precaution to avoid any damage to existing structures, making good to disturbed work to match existing finishes, elements, all to Engineer's satisfaction.					
	All demolished materials shall be removed and disposed from site. All salvaged materials and components which will be the Employer's property shall be safely dismantled and stored in the Client's yard in the compound and as directed by Architect.					
	The Contractor shall carry out a thorough survey and examination of building/structures to be demolished and that to be refurbished and submit report to Engineer on methodology of carrying out these demolition, alteration and refurbishment for approval.					
	The Contractor shall locate and mark out the position of existing services (concealed, underground and the like) that will be affected by demolition and upgrading work and submit layout plan of these concealed services to the Engineer.					
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION A - DEMOLITION AND ALTERATION WORKS	3.1		Carried to Collection		

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Spall concrete, crack concrete areas, surfaces shall be cut out with precaution about 75 mm deep, existing reinforcement exposed, provide new reinforcement and treat with epidermix compound and cast concrete grade 30 and or provide guniting as instructed by the Engineer and complete with finishes to match existing surfaces, all to Engineer's approval. Reinforcement to new concrete members shall be as follows, unless otherwise specified. Lintel - 90 Kg/m³ Cilll - 40 Kg/m³ Tie Column - 110 Kg/m³ The above reinforcement shall be included in the prices, in the item of work, as specified. **Note** The Contractor is informed that new finishes to alteration and extension which shall be as follows and shall be included in the prices of the item of work, until otherwise specified. (1) Provide 20 mm cement and render to external surfaces and paint with 3 coats of anti fungus paint and 15 mm cement sand render to internal surfaces and paint with 3 coats of acrylic emulsion paint to (2) Remove debonded render to existing blockwalling/ concrete member, hacked surfaces/provide bonding agent, and provide new 15 mm thick cement and sand render and painting with 2 coats of acrylic emulsion paint to MS Standard, internally to rendered and concrete surfaces and provide new 20 mm thick render and 2 coats of anti fungus paint to external surfaces of blockwalling and concrete members. (3) All new reinforced concrete lintel, ring beam, column shall be provided until 4 new Y10 mm dovels bars, anchored in existing concrete elements columns, concrete about 100mm deep, and dipped until epoxy otherwise. (4) All alteration shall have 1 coat of painting. On completion the whole of other shall be 3 coats painted which is measured seperatly.					

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
A	Make survey to electrical installation, light fittings and plumbing installation fire alarm system to existing lean to roof office overall size 7790 mm in length and 3200 mm wide and height not exceeding 3.00 m and dismantle and remove with precaution WC appliances, WHB, light fittings and the like and the necessary accessories, make good to disturbed structures and salvaged materials stored as before, and sealed off existing network to Engineer's approval.	Sum				
B	Make survey and dismantle existing timber false ceiling made up with plywood and timber suspension system about 25 m^2 and about 300mm from soffit of rafter to roof sheeting, make good to disturbed structures, salvaged material stored on Client's premises as instructed by the Engineer (about 23 m^2)	Sum				
C	Make survey and dismantle existing glazed plywood timber partition, made up with timber framing and studs and overall length about 6.00 m, height about 2.85 m from finish floor level, including removal of flush door size 900 x 2100 mm and make good to disturbed structures, salvaged materials stored in Client's premises as instructed by the Engineer (In 1 No.).	Sum				
D	Make survey to existing lean to roof sheeting timber purlins, wall plates, rafters, and ensure they are in good quality, replaced or repair as required and complete with finishes including making good to flashing, verge due to demolition of claustra block, and due to extension of offices. (Existing roof size 7790 mm and 3200 mm width in plan)	Sum				
E	Dismantle existing naco opening overall size 800 x 1600 mm high in blockwalling, and salvaged material handed over to Client as before, (In 2 Nos.) Rate shall include for making good as before.	Sum				
F	Form door opening size 900 mm wide in low 200 mm thick blockwalling 900 mm high, to receive new door, complete with jamb/finishes, making good to floors, and including 2 coats of painting.	Sum				
G	Ditto but form door opening size 900 mm wide and 2100 high in 200 mm thick blockwalling including concrete lintel, as before, complete with finishes as before. (In 2 Nos.)	Sum				
H	Allow to construct ring beam size 200 mm x 300 mm deep, in concrete grade 30, with reinforcement not exceeding 160 kg/m^3, including strimps and dowelling to existing concrete beams, all around office area girth not exceeding 21.20m, complete including formwork finishes, 2 coats of paint and the like, and any interface work to existing roof sheeting and making good to disturbed structure. (In 1 No.)	Sum				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION A - DEMOLITION AND ALTERATION WORKS	3.3	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
A	Demolish 150 mm to 200 mm thick blockwalling, to receive new alignment of blockwalling and overall length 3.00m and 2.80m high. Rate shall include making good to existing structure and carting away all arising. (In 1 No.)	Sum				
B	Construct new 200 mm thick low blockwalling 1.00 m high starting from floor level, including hacking , bonding, dowelling, making good to disturbed structures and to floor screed and match existing finishes to Engineer's approval to receive. Blockwalling shall be about 1.00 m high, in about 6 m² total area. Rate shall include for reinforced concrete tie columns 200 x 200 mm full height ie about 2.85m high with concrete lintel to receive door (1 No.) window (2 Nos.), including dowelling, reinforcement at returns and the like and for forming openings to receive doors and windows complete with reinforced concrete lintel, cills and all finishes as specified. (In 1 No.)	Sum				
C	Ditto but blockwalling shall be not exceed 2.80 m high, in about 17 m², with tie columns at 2.00 m centres and at corners and the like and forming opening to receive new door and windows and complete with lintel, cills and finishes as specified.	Sum				
D	Make survey and demolish 150 mm thick claustra block and dismantle naco openings, overall size varying from 1.00 to 2.00 m wide and 2.40 m high and allow for making good to disturbed structures to receive new aluminium openings (In 3 Nos.)	Sum				

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
A	Make survey, remove existing naco opening 800 mm x 1800 mm and closed with 200 mm thick good to rendered surfaces, and including 3 coats of painting and to form opening to receive window 800 x 1300 mm, complete with lintel, cills and finishes as specified. (In 3 Nos.)	Sum				
B	Supply and fix new prepainted metal corrugated sheeting 550 mpa yield sheet 125 g/m², in zinc alloy roof sheeting, complete with fixing tapping screws, flashing, verge and purlins, wall plate, rafters to make existing and colour to roof sheet to match existing roof size 3775 mm in length and 3200 mm wide on plan. (As per Engineer drawings and Architect drawings) (In 1 No.) Contractor need to submit shop drawings, with fixing details, rag bolts, anchor bolts, metal cleats and the like, pepared by specialist metal roof Contractor. Shop drawings shall be on A3 size, printed copy in 3 copies and two electronic version.	Sum				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION A - DEMOLITION AND ALTERATION WORKS	3.5	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Drywall Partition					
A	Drywall partition 75 mm thick with cementitious board 12 mm thick on both sides, with metal studs and skim coat on both sides, but with surfaces to receive wall tiles, about 1.20 m high in toilet sides. All skim coat surfaces shall be acrylic painted in 3 coats, as specified. Overall size 3.00 m in length and 2.85 m average height. (Rate shall include for M&E services, cut out and the like and reinforced MDF board for fixing mirrors and appliances.) (In	Sum				
	False Ceiling					
B	6 mm thick moisture resistant false ceiling with suspension system in well seasoned and kiln red meranti timber framing, treated with bituminous paint. False ceiling shall be flat and 2.60 m high for floor finishes and with 10 x 6 mm grooves black painted on timber suspension runners, and at extremity of walls. Rate shall allow for cut outs to receive lights, extraction and the like. All exposed surfaces of plywood/timber shall be 3 coat painted to Architect's approval, including filling of joint, sanding and spray painting.	m^2	36			
	Floor finishes					
C	Make survey and provide min 25 mm thick cement and sand (1:3) floor screed smooth to welled finish with bonding adhesive to existing floor and prepare surfaces to receive floor tiles.	m^2	36			
	Ceramic Flooring					
D	Supply and fix ceramic floor tiles laid to pattern, including strips and borders type homogenous antiskid, to BS Standard EN 176 with varying from 300 x 300 mm to 600 x 600 mm. Contractor to submit samples to Architect for approval prior to placing order) fixed on screeded floor with cement and sand mortar (1:1) and 'Nicobond' or equal approved floor tiles adhesive mixed and applied strictly in accordance with manufacturer's instruction and with all joints flush pointed with approved and matching colour tile grout adhesive and including all cutting, waste and cleaning on completion to floors. Contractor shall submit samples and dried laid prior fixing	m^2	36			
	Supply and fix the following homogenous ceramic tiles and to include for supply of cement mortar adhesive and pointing materials.					
E	Supply and fix 300 mm x 300 mm to 300 to 600 mm about 8 mm thick homogeneous ceramic wall tiles to BS Standard, EN 156 bedded and jointed with cement mortar and pointing with matching colour tile adhesive pointing including all cutting, waste and cleaning on completion and ditto.	m^2	9			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	SECTION A - DEMOLITION AND ALTERATION WORKS					
	Collection					
	Brought forward from page No	3.1				
	" " " " "	3.2				
	" " " " "	3.3				
	" " " " "	3.4				
	" " " " "	3.5				
	" " " " "	3.6				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION A - DEMOLITION AND ALTERATION WORKS	3.7	Carried to Summary Bill No 3			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 -UPGRADING WORKS AND EXTENSION WORKS TO EXISTING SEED STORE					
	SECTION B - OPENINGS					
	Supply and install the following epoxy powder coated aluminium, to Architect's approval which shall be to BS Standard and as per manufacturer's specification and to colour to Architect's approval. Openings shall be in approved sections including all necessary mullions, transoms, beading , glazing beads with mitre cut joints and the like and glazed with a minimum of 6 mm thick laminated glass unless otherwise specified (Contractor shall submit design calculation and shop drawings, with samples to Consultants , prior to fabrication for approval). Contractor shall ensure all openings are fixed on weathered rebated rendered jamb, lintel and cill and submit compliance certificate, prior to fixing of openings. All openings shall be epoxy powder coated finish to BS 6496, colour to Architect's approval (80 microns minimum thickness). Powder coated to be guaranteed for 10 years).openings to be pointed with silicone mastic all round internally and externally. All joints to be made weathertight with EPDM gaskets, etc. as specified by specialist. Openings shall be fitted with approved lock system and 3 lever system, cremone type, rustproof aluminium hinges, minimum 1½" pair per leaf, aluminium water bar, handles, unless otherwise specified. All ironmongeries, handles, door catch with stoppers and the like shall be heavy duty Hafele type and to Architect's approval. Contractor shall take site measurement for manufacture of the openings. Contractor shall submit design calculation and shop drawings, with samples to Architect, prior to fabrications, for approval. Contractor shall take site measurement prior to fabrication					
A	Door size 900 mm x 2100 mm, high with lower part in 1.50 mm thick aluminium panel, flutted and top part in 6 mm thick clear laminated glass.	Nr	4			
B	Ditto but with top glazed in frosted glass and door size 850 mm x 2100 mm high (Toilet Area)	Nr	1			
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION B - OPENINGS	3.8	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Windows					
A	Galzed Window size 2100 mm x 1465 mm sliding panel in 3 Nos panel, 1.00 m high sliding panel and 465 mm high fixed panel, in 3 equal parts	Nr	4			
B	Ditto but size 3000 mm x 1465 mm and in 4 Nos sliding panels, 1.00 m high and 465 mm high fixed panel, in 4 equal parts	Nr	3			
C	Ditto but size 800 x 1400 mm in double side hung casement 1.00 m high, and with 400 mm high fixed panel (In 2 parts)	Nr	3			
D	Ditto but size 1400 x 1400 mm and with 3 nos lower panel, with 1 m high, 2 nos side long 1.00 m high and 400 mm high fixed panel in 3 parts	Nr	1			
E	Ditto but 450 mm x 600 mm high top tray, with 6 mm thick laminated tested glass	Nr	1			
	Surface mounted metal grill protection to windows, ralw bolted to lintel and cills					
	Supply, fabricate and fix metal grill protection made up with 50 x 50 mm x 6 mm angle framing all around and bottom and top plates drilled at 150 mm c/c to receive 16 mm circular solid rod and with 2 nos horizontal ms plate, 40 mm wide and 8 mm thick, set at equal parts, with drilling at 150 mm centre to receive 16 mm diameter circular solid rod as before, including galvanised ralw bolting, at 450 mm centre on angle bar framing and complete vertical rods. Metal framing and grill shall be hot dipped galvanised after manufacture 720 g/m² and treated with grease remover, 2 patch etch primer, 3 coats of oil paint spray painted					
	Galvanised protection metal grill to windows					
F	To window clear size 2100 x 1465 mm high	Nr	4			
G	Ditto to clear 3000 x 1465 mm high	Nr	3			
H	Ditto to clear size 800 x 1400 mm	Nr	3			
I	Ditto to clear size 1400 x 1400 mm	Nr	1			
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION B - OPENINGS	3.9	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	SECTION B - OPENINGS					
	Collection					
	Brought forward from page No	3.8				
	" " " " "	3.9				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION B - OPENINGS	3.10	Carried to Summary Bill No 3			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 -UPGRADING WORKS AND EXTENSION WORKS TO EXISTING SEED STORE					
	SECTION C - SANITARY WARES AND ACCESSORIES					
	Supply and fix the following sanitary appliances and accessories to be fixed on blockwall surfaces which shall be of quality as specified and briefly described below and, or approved equivalent and with and including fittings, accessories, all to manufacturer's specifications and to Architect's approval. Rate shall allow for fixing to existing soil pipe, water supply and waste network, including any additional fittings, chasing and coring. Contractor shall make his own proper survey to mechanical network and ensure all items are covered to make the appliances functional, including testing and commissioning.					
A	Armitage shanks vitreous china close coupled wash down anti-vandal WC unit, type Magnia or equal approved, with vitreous china 7.5 litres cistern with economic water system and for rear water supply, top push button and heavy duty seat and cover and with dome headed screws; colour to Architect's approval.	Nr	1			
B	Armitage shanks wash hand basin unit, type cobra or equivalent with 1 Nr central taphole complete with chrome plated pillar self closing heavy duty tap make Groehe or equivalent including brass fittings, overflow fitment, waste plug, chrome plate lift up waste, plastic bottle trap, ancillary fittings and silicone pointing; colour to Architect's approval.	Nr	1			
C	Kitchen sink in stainless with single drainer and one bowl steel grade 304 one piece pressed bowl size 860 x 500 mm wide and 340 mm deep with single taphole for and including kitchen mixer tap in chrome finish type Grohe or equivalent to Architect's approval and including all necessary fittings, and including plastic bottle trap.	Nr	1			
D	Supply and install toilet roll holder fixed to wall in stainless steel grade 304, model to Architect's approval.	Nr	1			
E	Ditto but surface mounted stainless steel soap holder.	Nr	1			
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION C - SANITARY WARES AND ACCESSORIES	3.11	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Mirror					
A	Supply and install 6 mm thick 450 mm wide and 450 mm high polish plate mirrors with bevelled edges finish as per Specialist, to BS standard or equivalent standard and fixed with dome shape headed stainless steel screws countersunk and with 12 mm thick backing plywood moisture resistant to Architect's approval finished flush with wall tiles and fixing on rendered walls to toilet.	Nr	1			
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION C - SANITARY WARES AND ACCESSORIES	3.12	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	SECTION C - SANITARY WARES AND ACCESSORIES					
	Collection					
	Brought forward from page No	3.11				
	" " " " "	3.12				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION C - SANITARY WARES AND ACCESSORIES	3.13	Carried to Summary Bill No 3			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 -UPGRADING WORKS AND EXTENSION WORKS TO EXISTING SEED STORE					
	SECTION D - SUNDRIES					
	Concrete Worktop					
	Concrete worktop 100 mm thick and with 100 x 150 mm downstand concrete apron in reinforced concrete grade 25/20, complete with nominal reinforcement to Contractor's design and to Engineer's approval, including all necessary formwork, binding in wall and screeded and rendered and heavy duty ceramic floor tiles, as before described to top nd edge including matching aluminium trim and soffit painted finish . Rate shall allow for forming hole to receive kitchen sink as specified, unless otherwise specified.					
A	Concrete work overall width 600 mm and length 2500 mm and 100 mm thick with 150 mm thick support walls as required with rendered and painted, and tiling work.	Nr	1			
	Painting of Office Area					
B	Allow for painting in 2 coats with acrylic emultion paint to painted rendered surfaces of the office area, internally and externally (about 150 m²) (NB: Ceiling in plywood already painted)	Sum				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION D - SUNDRIES	3.14	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Electrical Installation, appliances ,AC unit and fire alarm as per Engineer's drawing					
A	Allow for electrical installation work by specialist Electrical Contractor having completed similar work. Electrical works, light fittings and accessories shall be to IEE Standard or approved equivalent standard and executed as per Engineer's instruction. Contractor shall submit samples, technical literature prior to placing order. Contractor shall submit shop drawings to Engineer for approval prior to start of the work. Contractor shall submit 3 sets of printed approved shop drawing and 1 copy in electronic version to Engineer for record purposes, within 2 weeks when the shop drawing is approved. All wiring shall be surface mounted in conduits and connection to existing network. The electrical work s also include AC network, extraction network, earthing with earth pits with aggregate finish and concrete kerb. Circuit wiring for sockets, AC network, kitchenette cooking areas, lighting shall be separate. Provision shall be made for labelling and the like. On completion of the work, the Contractor shall submit as built drawings both printed copy and in soft copy, as approved by the Engineer.	Sum				
	The functional requirement are as follows: (Including wiring, switch, equipment, light fittings and the like.)					
B	Encased light fittings 2 x 18 W for offices and kitchenette	Nr	6			
C	Toilet lights ceiling mounted	Nr	2			
D	13 A amp for offices and kitchenette with 3 pin	Nr	11			
E	AC unit with switch 1200 BTU include outdoor unit and drain pipe, includes AC unit equipment	Nr	3			
F	Extraction to toilet, powered by light switch 25 db noise level, includes for cut in blockwalling	Nr	1			
G	Fire Alarm system to office, kitchenette	Nr	3			
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION D - SUNDRIES	3.15	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	Generally					
A	Work incidental to plumbing,rainwater, drainage, AC, electrical, fixings	Sum				
B	Co-ordination with all engineering installation and making and setting out the positions of all works	Sum				
C	Cutting or forming all holes, mortices, chases, PVC sleeves or the like and making good finishing and the like including all associated builder's work	Sum				
	Building in or cutting and pining brackets or the like and making good finishing	Sum				
E	Protective to painting and finishes	Sum				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION D - SUNDRIES	3.16	Carried to Collection			

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 -UPGRADING WORKS AND EXTENSION WORKS TO EXISTING SEED STORE					
	Collection					
	Brought forward from page No	3.14				
	" " " " "	3.15				
	" " " " "	3.16				
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE SECTION H - SUNDRIES	3.17		Carried to Summary Bill No. 3		

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 3 - UPGRADING WORKS TO EXISTING SEED STORE					
	SUMMARY					
	SECTION A SUBSTRUCTURE	From	Page	3.7		
	SECTION B OPENINGS	From	Page	3.10		
	SECTION C SANITARY WARES AND ACCESSORIES	From	Page	3.13		
	SECTION D SUNDRIES	From	Page	3.17		
	BILL NO 3 -UPGRADING WORKS TO EXISTING SEED STORE	3.18	Carried to Main Summary			

BILL NO 4

MECHANICAL & ELECTRICAL WORKS

AGRICULTURAL MARKETING BOARD
ELECTRICAL INSTALLATIONS

SEED STORE
Bill No. 4 - M&E Works

Item	Description	Unit	Qty	Rate Rs.	Total Rs.
1.0	**Distribution Boards**				
1.1	Supply and install in existing coffret				
1.2.	MCB 32 A 4 P	u	1		
1.3	Polyester coffret to house the following:	u	1		
1.4	Repartiteur 4 P rated 125 A	u	1		
1.5	Main incoming breaker MCB 32 A 4 P	u	1		
1.6	Lighting circuit MCB 10 A 1 P + N	u	3		
1.7	Socket circuit MCB 20 A 1 P + N	u	1		
1.8	Socket circuit MCB 25 A 4 P	u	1		
.10	Extractor Fans circuit				
1.11	MCB 16 A 1 P + N	u	4		
1.12	25 A single phase contactors for extractor fans	u	4		
1.13	Timer 24 hr	u	4		
1.14	Rotary switches for the extractor fans	u	4		
1.15	By pass rotary switches	u	4		
1.16	Coffret c/w all accessories to IP 65 for the rotary switches &	u	1		
1.17	By pass switches				
2.0	**Lighting circuits**				
2.1	Supply & Install 3 x single core 1.5 mm² cable to run in concealed conduit				
	complete with isorange conduit & water proof switches to be located				
	near the distribution board - three circuits are required hence				
	one circuit per phase is required.				
2.2	Number of light points	u	12		
2.3	Supply and Install				
2.4	2 x 28 W Neon fitting IP 65 rating	u	11		
3.0	**Socket Circuit**				
3.1	Supply and install 3 x single core 2.5 mm² PVC cable .				
	Cable to run in 20 mm dia. PVC pipe.The sockets are to be				
	installed adjacent to the proposed distribution board.				
3.2	No. of single phase circuit	u	1		
3.3	No. of three phase circuit	u	1		
3.4	Supply and install industrial type 16 A 3 pin	u	1		
3.4	Supply and install industrial type 25 A 5 pin	u	1		
	Bill No. 4 - M&E Works	Page 4.1		Carried to Collection Page	

AGRICULTURAL MARKETING BOARD
ELECTRICAL INSTALLATIONS
SEED STORE
Bill No. 4 - M&E Works

Item	Description	Unit	Qty	Rate Rs.	Total Rs.
4.0	**Cables**				
4.1	Supply and lay on cable tray 10 mm² 5 core copper conductor				
	armoured cable from the existing D.B to the proposed D.B	m	25		
4.2	Supply and fix cable trayCable tray	m	30		
	Quantities as per items 4.1 & 4.2 are remeasurable				
5.0	**Extractor Fans**				
5.1	The extractor fans shall be fixed on the rear wall between the				
	windows at high level 4 Nos. fixed extractor fans of capacity				
	3000 $m^{3/}$ hr and shall be complete with outdoor metal louveres &				
	insect screening mesh				
5.2	Supply and install 3 x single core 2.5 mm² PVC cable .to run in				
	concealed conduit to feed the extractor fans	u	4		
5.3	Supply and install extractor fans as per Item 4.0	u	4		
6.0	Allow for as made drawings	u	lot		
6.1	Allow for testing and issue of certificate	u	lot		
	Bill No. 4 - M&E Works	Page 4.2		Carried to Collection Page	

	CONSTRUCTION OF A GARLIC SEED STORE FOR AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 4 - MECHANICAL AND ELECTRICAL WORKS					
	MECHANICAL AND ELECTRICAL DESIGN AND BUILD PORTION					
	Fire Alarm Installation (Design and Build)					
A	Design, Supply, Install, test and Commission fire alarm system to BS standard and to Engineer's approval with conventional Fire alarm panel with LCD display, battery back up (72 hrs standby), conventional surface mounted optical smoke detector, heat detector including electronic sounders 100 dB (at 1.00 m) (in 2 nos.) with strobe light, conventional break glass type manual call point, photo luminescent signage for manual call points. Contractor shall submit shop drawings to Engineer for approval, as before prior to execution of the works.	Sum				
	Fire Extinguisher including approved signage to Engineer's approval					
B	5 Kg portable CO_2 fire extinguishers , to BS standard	Nr	2			
C	4 Kg portable ABC fire extinguisher as before	Nr	1			

Item	Description	Unit	Qty	Rate Rs.	Total Rs.
	BILL NO 4 - M&E Works				
	Collection Page				
	Brought forward from page No	4.1			
	" " " " "	4.2			
	" " " " "	4.3			
	Bill No. 4 - M&E Works	Page 4.4		Carried to Summary	

BILL NO 5

CONTINGENCIES

	CONSTRUCTION OF A GARLIC SEED STORE AT AMB				AMOUNT	
Item	DESCRIPTION	UNIT	QTY	RATE	Rs	Cs
	BILL NO 5					
	CONTINGENCIES					
A	Provide the sum of MUR 500,000 (Rupees Five Hundred Thousand) for Contingencies to be expended or deducted in whole or in part at the discretion of the Engineer.				500,000	00
	BILL NO 5 CONTINGENCIES	5.1		Carried to Main Summary		

MAIN SUMMARY

AGRICULTURAL MARKETING BOARD

CONSTRUCTION OF A GARLIC SEED STORE AT AMB

MAIN SUMMARY OF BID

Item	DESCRIPTION			AMOUNT Rs	AMOUNT Cs
	BILL NO 1 Preliminaries and General Items	Page	1.37		
	BILL NO 2 Seed Store	Page	2.19		
	BILL NO 3 Upgrading Works to Existing Office at Seed Store	Page	3.18		
	BILL NO 4 Mechanical & Electrical Works	Page	4.4		
	BILL NO 5 Contingencies	Page	5.1		
A	Sub Total				
B	***Less*** Discount offered (if any)				
C	Sub Total excluding VAT (A - B)				
D	***Add*** 15% Value Added Tax (VAT) (15% of C)				
E	**Total Amount (C + D) of Fixed Price Bid inclusive of Value Added Tax (VAT) carried to Form of Bid**				

Amount in Words (Fixed Price Bid) .....
.....
.....**Including Value Added Tax (VAT)**

Name of Bidder.....
.....
.....

Dated this ..... Day of 2016

Signed .....

Name .....

In the capacity of .....

Duly authorised to sign on behalf .....
.....

In the capacity of .....

M/S

BIDDING FORMS

Bid Submission Form

Date: _____
Bidder's Reference No.: _____
Procurement Reference No:.....

To:

Agricultural Marketing Board
Dr. Georges Leclezio Avenue,
Moka

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 Ninety (90) 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;[1]

(l) We hereby "*apply/do not apply*" for Margin of Preference as provided in the bidding document;[2]

(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: _____

[1] *Use one of the two options as appropriate.*

[2] *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 *(insert name of public body)* 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.

Name of bidder: .....

Date: .....

Signature: .....

Name: .....

In the capacity of: .....

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].* [3]

	Project name	Client	Client's contact person	Contract Price MUR	Ongoing/ Completed	Payment received (MUR)		
						(yr)	(yr)	(yr)
(a)								
(b)								

[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 *[insert number]* years. *[Also list details of work under way or committed, including expected completion date(s).]*[4]

[3] 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.

[4] 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.

Project/Contract name and country	Name of client and contact person	Type of work performed and year of completion	Value of contract (national currency)
(a) (b)			

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).]*

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(a) (b)			

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).]*

Position	Name	Years of experience (general)	Years of experience in proposed position
(a) (b)			

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

Sections of the Works	Value of subcontract	Subcontractor (name and address)	Experience in similar work
(a) (b)			

[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.]*[5]

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.

[5] 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.

1.9 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.

Other party(ies)	Cause of dispute	Amount involved
(a)		
(b)		

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.

Appendix A

(Bank's Official Letterhead)
Bank Certificate

Procurement Reference No: .....

Name of Project: .....

For: ..... (Name of public body)

THE UNDERSIGNED

(Bank Name): .....

(Address): .....

Certifies that the firm:

.....(Name of firm and address)

for the purposes of submitting a bid for the above-mentioned project has, at the present time, the financial means and resources for the proper execution of the Contract (if awarded) with a minimum of liquid assets and/or credit facilities of (MUR .....) net of other contractual commitments.

(in words and figures)

Drawn at .....

Date: .....

For: ..... (Bank Name)

Represented by: ..... (Name of Officer)

Status: .....

Signature: .....

[Bank Seal]

[Note: *The bidder should ensure that the Bank Certificate submitted by a Bank shall be substantially similar to the above format*

SECTION III (CONT.)

LIST OF TENDER DRAWINGS

NEW SEED STORE AT AGRICULTURAL MARKETING BOARD			
DRAWING LIST			
DRAWING No.	DRAWING TITLE	Date of Issue	Revision
ARCHITECT DRAWINGS			
RA16AMBSSA100	SITE PLAN		
RA16AMBSSA200	GROUND FLOOR PLAN		
RA16AMBSSA201	ROOF PLAN		
RA16AMBSSA300	SECTION A-A & B-B		
RA16AMBSSA301	SECTION B - B		
RA16AMBSSA400	MAIN & LHS ELEVATIONS		
RA16AMBOBA200	GROUND FLOOR PLAN		
RA16AMBOBA300	SECTION C-C		
RA16AMBOBA400	ELEVATION 1 & 2		
RA16AMBOBA600	SCHEDULE OF WINDOW		

NEW SEED STORE AT AGRICULTURAL MARKETING BOARD			
DRAWING LIST			
DRAWING No.	DRAWING TITLE	Date of Issue	Revision
SERVANSINGH & JADAV PARTNERS DRAWINGS			
16-113-004-L1	FOUNDATION AND GROUND FLOOR LAYOUT		
16-113-004-L2	ROOF LAYOUT		
16-113-004-R1	ROOF BEAMS & REINFORCEMENT LAYOUT		
16-113-004-R2	FOUNDATION AND GROUND FLOOR LAYOUT		
16-113-004-SW1	SITEWORKS LAYOUT AND DETAILS		

SECTION IV

EVALUATION CRITERIA

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:

1.1For 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 %.

1.2For National Bidding

(i)A local Small and Medium Enterprise, having an annual turnover not exceeding Rs 50million 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

CONDITIONS OF CONTRACT AND CONTRACT FORMS

SECTION V

GENERAL CONDITIONS OF CONTRACT

FIDIC FEDERATION INTERNATIONALE DES INGENIEURS – CONSEILS

CONDITIONS OF CONTRACT
FOR
WORKS OF CIVIL ENGINEERING CONSTRUCTION

PART 1 – GENERAL CONDITIONS

NOTE TO BIDDERS :

FOR FULL DETAILS OF PART 1 THE GENERAL CONDITIONS OF CONTRACT, THE BIDDER SHOULD REFER TO THE PUBLISHED DOCUMENT – CONDITIONS OF CONTRACT BY FEDERATION INTERNATIONALE DES ENGENIEURS-CONSEILS (FIDIC) – FOURTH EDITION 1987 – REPRINTED 1988 WITH EDITORIAL AMENDMENTS – REPRINTED 1992 WITH FURTHER AMENDMENTS

THIS COPY IS AVAILABLE AT ARCHITECT'S OFFICE FOR **CONSULTATION** PURPOSES

BILL NO 1: PRELIMINARIES AND GENERAL REQUIREMENTS

Item	Description			Amount Rs.	Cs
	The Appendix to Conditions of Contract will be as follows:-				
			Clause		
	Amount of Performance Security	10.1	**Ten per cent** of the Contract Price		
	Minimum amount of Insurance Including Employer's Representatives	23.1 & 23.2	**MUR 10.00 million** – for any occurrence or Series of occurrence arising out of any event		
	Value and content of Building For insurance purposes	23.1	**MUR 6.00 million**		
	Time for issue of notice to commence	41.1	Fourteen (14) days		
	Time for completion (overall completion)	43.1	**183 Calendar days**		
	Amount of liquidated damages Limit of Liquidated damages	47.1	6,000 per calendar day 5% of the contract price		
	Defects Liability Period	49.1	**365 Calendar days**		
	Percentage of invoice value Value of listed materials and Plant	60.1 (c)	**100% per cent**		
	Percentage of Retention	60.2	**Ten per Cent**		
	Limit of Retention Money	60.2	**Ten per cent**		
	Minimum Amount of Interim Payment Certificates	60.2	**MUR 200,000**		
	Rate of interest upon unpaid sums	60.10	**At Prevailing Bank Rate**		
	Advance Payment	60.11	10 % of Contract Price less Contingencies		
	Signature of Tenderer				
	Amount carried to Collection				

SECTION VI

PARTICULAR CONDITIONS OF CONTRACT

AGRICULTURAL MARKETING BOARD

Construction of a Garlic Seed Store at AMB

CONTENTS

PART II - CONDITIONS OF PARTICULAR APPLICATION

CONTENTS (Cont'd)

FIDIC CONDITIONS OF CONTRACT

PART II - CONDITIONS OF PARTICULAR APPLICATION

The clause numbers refer to the equivalent Clauses in Part I - General Conditions. The amendments to the General Conditions as set out hereafter shall be deemed to be incorporated in them. The Conditions of Particular Application shall prevail over those in the General Conditions of Contract.

Definitions

1.1 (a) (i) The Employer is the **Agricultural Marketing Board** whose registered address is: 5th Floor, Ken Lee Tower, Barracks Street, Port Louis, Mauritius.

(ii) The term "**Engineer**" throughout all the Contract shall be deemed to mean **Servansingh Jadav and Partners Consulting Engineers Ltd** and who shall also deem to mean the Civil & Structural Engineer. The Engineer shall: -

- Monitor progress and scheduling, and
- Monitor cost and administer all Contract Conditions, and
- Co-ordinate the efforts of Consultants, Contractors and Suppliers associated with or working in conjunction with the project.

The Engineer's registered address is: 7, Remy Ollier Street, Beau Bassin.

(b) (i) Delete sub clause (b)(i) and replace by:

"Contract" means these conditions (Parts I and II), the Specifications, the Drawings, the Priced Bills of Quantities, Addendum to tender documents (if any), Schedule of Rates and Prices (if any), the Tender, the Letter of Acceptance, the Contract Agreement (if completed) and the Appendices to the aforementioned documents and such further documents as may be expressly incorporated in the Letter of Acceptance or Contract Agreement (if completed)."

1.2 Add in line 1 after "Conditions" the words:

"and Conditions of Particular Application and Specifications"

Engineer's Duties and Authority	2.1	Add new paragraph Add new paragraph after Sub-Clause 2.1(b) With reference to this Sub-Clause 2.1(b), the following provision shall also apply: The Engineer shall obtain the specific approval of the Employer before taking any of the following actions specified in Part I: i. consenting to the subletting of any part of the Works under Clause 4; ii. certifying additional cost determined under Clause 12; iii. determining an extension of time under Clause 44; iv. issuing a variation under Clause 51, except in an emergency situation, as reasonably determined by the Engineer. v. fixing rates or prices under Clause 52. Add additional paragraph as follows: (d) Notwithstanding the obligation, as set out above, to obtain approval, if in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute al such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Contractor shall ascertain whether, in his opinion, such instruction involves an addition to the Contract Price, and in accordance with Clause 52 he shall notify the Engineer accordingly, with a copy to the Employer.

			Add at the end of clause 2.4:
Appointment of Assistants	2.4		The Employer has appointed the following persons to assist the Engineer in the carrying out of his duties under sub clause 2.2: • Chuttur & Partners Ltd as Quantity Surveyors. • Ramphul Architects as Architect
Assignment of Subcontractor's Obligations	4.2		Delete in line 6 and 7 the words "at the Employer's request and cost". Add the following at the end of the Sub clause. "The assignment of the benefit of such obligation shall be at the Contractor's cost".
Language/s and Law	5.1	(a)	The Language of the correspondence is English.
		(b)	The Law that is in force in the Republic of Mauritius shall apply to the Contract and according to which the Contract shall be construed.
Priority of Contract Documents	5.2		Delete part of Sub Clause as follows: "and in such event, unless otherwise provided in the Contract the priority of the documents forming part of the Contract shall be as follows, i.e. all list of documents 1 to 6".
Performance Security	10.1		Delete clause 10.1 and 10.2 and replace by : The Contractor shall provide, within **twenty-eight** days from issue of Letter of Acceptance by the Employer, a Performance guarantee from a recognised bank located in Mauritius which shall be approved by the Engineer of an amount equivalent to ten (10) percent of the Contract Price for the due performance of the Contract under the terms of a Bank Guarantee. The Bank Guarantee shall be established in Mauritian Rupees and shall remain in full force not later than 28 days from the date of issuance of the Defects Liability Certificate. The terms of the Performance Guarantee shall be in the form annexed to the tender documents. The cost of the guarantee shall be at the expense in all respects of the Contractor. Performance Bond and Advance Payment Guarantee shall be given for phases, as per the provisions of the Contract. The Engineer shall certify works completed for each phase, to allow

		Contractor to give Performance Bond and Advance Payment Guarantee for the next phases. Unless and until the Contractor submit Performance Bond and Advance Payment Guarantee, no advance payment shall be issued.
Programme to be submitted	14.1	The time within which the programme shall be submitted shall be 28 days from the issue of the letter of Acceptance by the Employer.
Cash Flow Estimate to be submitted	14.3	The time within which the detailed Cash Flow Estimate shall be submitted shall be 21 days.
Contractor's Superintendence	15.2	Add the following sub clause after clause15.1: The Contractors authorised representatives as specified in the Bidding Document shall be fully fluent in English to ensure the proper transmission of instructions and information.
		Add the following sub clauses after clause 16.2:
Language Ability of Superintending Staff	16.3	A reasonable proportion of the Contractor's Superintending staff shall be fluent in English to ensure proper transmission of instructions and information.
Employment of Local Personnel	16.4	The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour of Mauritian origin within the Republic of Mauritius.
Employer's Risks	20.4	With reference to Sub Clause 20.4 the following events shall not be considered as Employer's Risks. • Cyclones • Floods • Riot, Civil commotion or disorder
Scope of Cover	21.2	Add after "..... insurance" in line 1 "shall be with Insurance Company registered with the Financial Services Commission".
Exceptions	22.2	Delete Sub Clause (c) & (d) Insert in sub clause 21(a) (i) after whatsoever cause arising including cyclones, floods, riot, until commotion or disorder (ii) Add new sub clause 21 (c)

		"The costs of insurance premium shall be borne entirely by the Contractor".
Minimum Amount of Insurance	23.2	Add after "..... insurance" in line 1 "shall be effected with Insurance Company registered with the Financial Services Commission and ....".
Insurance against Accident to Workmen	24.2	Add after "shall insure" in line 1 "with Insurance Company registered with the Financial Services Commission".
Compliance with Statutes, Regulations	26.1	Add after the words "of any such provisions" in line 10 "All fees and expenses resulting thereon shall be borne by the Contractor". Add new paragraph after Sub-Clause 26.1 The Contractor shall acquaint himself and comply with all regulations in respect of import of plant and equipment, materials, fiscal taxes, custom duties, registration duties, transfer of capital etc., also all regulations regarding the employment of his labour force, staff and other personnel, as well as the provisions of the Environment Protection act of 1991. No claim by the Contractor for additional payment will be entertained by the Employer on the grounds of any misunderstanding or misinterpretation in respect of any such matter or otherwise.
Rates of Wages and Conditions of Labour	34.2	Add the following sub clauses The Contractor shall comply with the Labour Act 1975 (Act No. 50 of 1975) as amended by Act No. 19 of 1980 and as subsequently amended and shall be in compliance with Standing Regulations and shall pay rates of wages and observe hours and conditions of labour not less favourable than those established for the trade or industry by law or by way of negotiation or arbitration to which the parties are organisations of employers and trade unions representative respectively or substantial proportions of the employers and workers engaged in the trade or industry.

Rates of Wages and Conditions of Labour (Cont.)		Add the following sub clauses In addition to other legislation, the Contractor shall acquaint himself with the relevant enactment which set out minimum remuneration and conditions of employment of various categories of workers.
Certificate of Compliance With Conditions of Clause	34.3	The Contractor shall in respect of all persons employed by him in Mauritius (whether in the execution of the Contract or otherwise) in every factory, workshop or place used by him for the execution of the Contract, comply with the general conditions of this Clause and, if required by the Employer, shall, before entering into the Contract, certify that to the best of his knowledge and belief he has complied with such general conditions for the three months immediately preceding the date of submission of the Contractor's Tender.
Trade Union Membership	34.4	The Contractor shall recognise the freedom of his workpeople to be members of registered trade unions
Observance by Sub-contractors	34.5	The Contractor shall be responsible for the observance of the provisions of this Clause by Sub-Contractors employed by him in the execution of the Contract.
Employment of Persons in the Service of others	34.6	The Contractor shall not recruit or attempt to recruit his staff and labour from amongst persons in the service of the Employer or the Engineer.
Repatriation of Labour	34.7	The Contractor shall be responsible for the return to the place where they were recruited or to their domicile of all such persons as he recruited and employed for the purposes of or in connection with the Contract and shall maintain such persons as are to be so returned in a suitable manner until they shall have left the Site or, in the case of persons who are not nationals of and have been recruited outside Mauritius, shall have left Mauritius.

Housing for Labour	34.8	The Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purposes of or in connection with the Contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cookhouses, fire prevention and fire-fighting equipment, air conditioning, cookers, refrigerators, furniture and other requirements in connection with such accommodation or amenities. The Site of Works shall not be permitted to be used as temporary camps/housing by the Contractor.
Accident Prevention Officer; Accidents	34.9	The Contractor shall have on his staff at the Site an officer dealing only with questions regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for this work and shall have the authority to issue instructions and shall take protective measures to prevent accidents.
Health and Safety	34.10	Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff first aid equipment and stores, sick bay and suitable ambulance service are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.
Measures against Insect and Pest Nuisance	34.11	The Contractor shall at all times take the necessary precautions to protect all staff and labour employed on the site from insect nuisance, rats and other pests and reduce the dangers to health and the general nuisance occasioned by the same. The Contractor shall provide his staff and labour with suitable prophylactics for the prevention of malaria and take steps to prevent the formation of stagnant pools of water. He shall comply with all the regulations of the local health authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticide all buildings erected on the Site. Such treatment shall be carried out at least once a year or as instructed by the Engineer.
Epidemics	34.12	In the event of any outbreak of illness of an

		epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.
Burial of the Dead	34.13	The Contractor shall make all necessary arrangements for the transport, to any place as required for burial, of any of his expatriate employees or members of their families who may die in Mauritius. The Contractor shall also be responsible, to the extent required by the local regulations, for making any arrangements with regard to burial of any of his local employees who may die while engaged upon the Works.
Supply of Water	34.14	The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of his staff and labour.
Alcoholic Liquor or Drugs	34.15	The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his sub contractors, agents, staff labour.
Arms and Ammunition	34.16	The Contractor shall not give, barter or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.
Festivals and Religious Customs	34.17	The Contractor shall in all dealings with his staff and labour have due regard to all recognised festivals, days of rest and religious or other customs.
Disorderly Conduct	34.18	The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labour and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.
Time for Completion	43.1	Add the following at the end of clause 43.1: Pursuant to the aforesaid, the works may have to be completed in sections and the Employer may take occupation of the works progressively over

		the Contract period for the purpose of installing his fittings, furniture and equipment. To this end, the Contractor shall complete the works in such sections and within such time as may be agreed between the Engineer and the Contractor. All costs incurred as a result of the sectional completion of the works and early occupation by the Employer shall be borne by the Contractor.
Extension of Time Completion	44.1	"For the application of Clause 44.1, a cyclone for warning class 3 and 50 mm or more rainfall over 24 hours, as certified by the Meteorological Authority shall be considered under "exceptionally adverse climatic conditions"
Liquidated Damages for Delay	47.1	Add after the words "without prejudice to any other method of recovery," in line 10 the words "and without the Employer having to fulfill any judicial or extra judicial formality or to serve a "mise en demeure" to that effect"
Variations Exceeding 15 Per Cent	52.3	Replace "15 per cent" in lines 8 and 19 of sub- clause 52.3 by "**twenty** per cent".
Substantiation of Claims	53.3	Add the following at the end of this Sub clause "Any claim under the provision of this sub clause must be proven, the cost duly supported by evidences such as salary slips, vouchers, income tax declaration form of personnel, purchase or rental values and computerized monthly cost."
Method of Measurement	57.1	Delete clause 57.1 and add the following: The works shall be deemed to have been measured in accordance with the Principles of Measurement (International) for works of construction; July 1979 Edition, issued by the Royal Institution of Chartered Surveyors, as may be amended by the special requirements of the Bills of Quantities and/or specifications.
Definition of "Provisional Sum"	58.1	Delete "Provisional Sum" in line 1 of sub clause 58.1 and add the term "Provisional Sum or Prime Cost Sum or P.C Sum", if any.
Certification of Payments To Nominated Subcontractors	59.5	Add new Sub Clause 59.6 as follows: "Notwithstanding the Sub Clause 59.1 to 59.5 in respect to Nominated Subcontractors, the Engineer

shall be entitled to demand from the Contractor to supply reasonable evidence that approved Domestic Subcontractors have received all amounts due in accordance with the previous Payment Certificates, less applicable retentions, deductions for retention or otherwise.
The above Engineer's demand shall be before issuing as per Clause 60 any certificate which includes any payment in respect of work done or goods, materials & plants supplied any of the approved Subcontractors.
The Contractor shall ensure that the approved subcontractor receive payment within 7 days from the date the Contractor receive payment from the Employer.

Advance Payment 60.11

Add the following sub clause after clause 60.10:

On the application of the Contractor the Employer will effect within fifteen days from date of certification the advance payment of 10 (ten) per cent of the Contract Sum less contingency sums provided that the Contractor furnishes at his own expense an advance payment guarantee as specified and which shall be in addition to the Performance Guarantee to be provided under Clause 10 hereof from a commercial bank in Mauritius which shall be approved by the Engineer for the repayment on demand of the whole or any outstanding balance of the said advance. The terms of the guarantee shall be in the form annexed to the tender documents and all costs in connection shall be at the expense in all respects of the Contractor. Repayment of advance payment by the Contractor to the Employer shall start when the certified gross value of work reaches 20% of the Contract Price less Contingency sum.

Performance Bond and Advance Payment Guarantee shall be given for phases, as per the provisions of the Contract. The Engineer shall certify works completed for each phase, to allow Contractor to give Performance Bond and Advance Payment Guarantee for the next phases. Unless and until the Contractor submit Performance Bond and Advance Payment Guarantee, no advance payment shall be issued.

Recovery of advance payment shall be at the rate of fifteen percent of the amount of advance payment from monthly payment certificates.

Advance payment shall be recovered in full prior to when the gross value of works certified reaches 80% of the Contract price, less contingency sum.

Arbitration	67.3	In lines 6 and 7 delete the words "finally settled, ... Rules of Conciliation and Arbitration of the International Chamber of Commerce by one or more arbitrators appointed under such Rules" and substitute the following : "referred to one or more arbitrators to be agreed between the parties, or failing agreement to be nominated by the Judge in Chamber of the Supreme Court of Mauritius in accordance with the provisions of Act No. 1 of 1981 and any such reference shall be deemed to be a submission to arbitration within the meaning of the said Act or any statutory re-enactment or amendment thereof for the time being in force. The award of the arbitrator or arbitrators shall be final and binding on the parties." The cost of Arbitration shall be borne by the losing Party.
Notices to Employer and Engineer	68.2	Any notice to be given to the Employer or to the Engineer under the terms of the Contract shall be served by sending the same by post or delivering the same to the respective addresses so nominated in Clause 1.
Increase or Decrease of Cost		Delete sub-clause 70.1 and 70.2 inclusive and substitute the following,
	70.1 &70.2	"The Contract Price shall not be subject to any adjustment in price in respect of any increases or decreases whatsoever in the cost of labour, materials and/or any increases arising out of, in connection to transport, fuel, freight, duties, taxes, variations in exchange rates, devaluation, etc., or any other matters affecting the cost of execution of the Contract"
Currency Restrictions	71	Delete Clause 71 in its entirety.
Rates of Exchange	72	Delete Clause 72 in its entirety. Add the following clause to the General Conditions.
Taxation	73	The Contractor and his staff shall be liable to pay all income or other taxes and Custom Duties as required by regulations which may be in force during the period of the Contract.

Non-liability personal	74	Neither any member or officer of the Employer nor of the Engineer nor any of his or their employees shall be in anyway personally bound or liable for the acts or obligations of the Employer under this contract or answerable for any default or omission in the observance or performance of any of the acts, matters or things which are herein contained. Add the following Clause to the General Conditions.
Regulations and Immigration Laws	75.1	The Contractor, before tendering for the work, shall acquaint himself with all regulations in respect of import of plants and equipment, material and labour regulations regarding fiscal taxes, custom duties, registration duties, transfer of capital, etc., and all regulations regarding the importation of unskilled and skilled labour, supervisory staff and other personnel for the execution of the work and shall comply with the said regulations. The Contractor shall also examine and ascertain the Conditions of Works, labour, availability of materials, the nature of site, etc. before tendering for the work. No claim whatsoever by the Contractor for additional payment or extension of time will be entertained by the Employer on the grounds of any misunderstanding or misapprehension, in respect of any such matter or otherwise.
Fraud And Corruption	76.1	If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site.
	76.2	Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Sub Clause 16.2.

Fraud and Corruption 76.3 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

(a) 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; or

(b) acts intended to materially impede the exercise of an inspection and audit rights provided for under Sub-Clause 76.4.

Fraud And Corruption 76.4 The Contractor shall permit persons appointed by the Employer to inspect the Site and/or the accounts and records of the Contractor and its

sub-contractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the Employer if required by the Employer. The Contractor's attention is drawn to Sub-Clause 76 which provides, inter alia, that acts intended to materially impede the exercise of the inspection and audit rights provided for under Sub-Clause 76.4 constitute a prohibited practice subject to contract termination.

Add the following Clause to the General Conditions,

Joint and Several Liability	77.1	If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.

SECTION VII

CONTRACT FORMS

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 . . . . . *[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 28 days in accordance with the General Conditions of Contract, using for that purpose of the Performance Security Form included in Section VII (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: _____
for and on behalf of the Employer

in the presence of: _____
Witness, Name, Signature, Address, Date

Signed by: _____
for and on behalf the Contractor

in the presence of: _____
Witness, Name, Signature, Address, Date

Performance 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, within five working days, 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).....

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]***. . . . . (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, an advance payment in the sum . . . . . ***[name of the currency and amount in figures]*** [1]. . . . . (. . . . . ***[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]***. . . . .) within five working days, 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 . . . . . , ... [2], 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.

Form of Preference Security
(Bank Guarantee)

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. _____ dated _____ 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]*[1], 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]*.[1]

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 _____

_____

SECTION VIII

TECHNICAL SPECIFICATIONS

SPECIFICATIONS

RECORDIAL NOTES

A The Specification referred to in the Contract and as enclosed hereafter are subdivided in five parts namely:

Part I : Standard Specifications which is deemed to mean Architect's Specifications

Part II : Civil and Structural Engineering Specifications

Part III : Mechanical and Electrical Engineering Services Specification

Notwithstanding anything contained in the Contract Documents, the Engineering Specifications for Civil and Structural Engineering shall take precedence over the Architectural Specifications in so far as they relate to Civil and Structural Engineering or related matters.

B All measurement and pricing notes included in the Architectural Specifications, Landscaping Architect Specifications and Services Engineering Specifications shall however be deemed to apply to the whole of the works described in the Bills of Quantities, unless otherwise specified.

PART I – STANDARD SPECIFICATIONS

SECTION 1 – GENERAL

1.1 SITE VISIT

The tenderer is advised to visit and inspect the proposed site for which he is tendering prior to submission of his tender. The successful tenderer shall be deemed to have so satisfied himself as to the nature and extent of the works and no claim for extra expense or for extension of time under the contract will be allowed on the grounds that insufficient information was given in the Tender Documents and or that the contractor was not conversant with the conditions prevailing at the site or that during the course of the work the contractor encountered unexpected difficulty which could have been avoided by inspection of the site.

1.2 MATERIALS AND WORKMANSHIP

The quality of materials, goods and standard of workmanship shall be of the best quality of their respective kinds and to the Architect's entire satisfaction and shall comply in all respect to the latest relevant British Standard Code of Practice and or Mauritius Standards referred to herein as BS COP and MS respectively unless otherwise stated.

Preambles and descriptions of materials, goods and workmanship given in any one section or trade shall apply throughout all other sections or trades of this Specifications unless otherwise described.

The Contractor's attention is drawn to his responsibilities as to defects after completion as defined in Articles 1792 and 2270 of the Civil Code.

1.3 DISCREPANCIES

The Contractor shall notify the Project Manager / Architect in respect of Materials and Workmanship specified herein, where any of the above conflict with each other or any other specified requirements.

1.4 SUBMISSION OF DOCUMENTS

The Contractor shall when so requested submit all at his own expense to Project Manager / Architect copies of relevant British Standards, Codes of Practice, Mauritian Standards, other equivalent standards for inspection; Compliance certificate in conformity with the specification from manufacturers; manufacturer's specification and recommendation for the use of materials specified.

1.5 ORDER OF MATERIALS

The Contractor shall place orders for all materials, equipments, fittings, etc. within fifteen days after being awarded the contract. He shall keep the Project Manager / Architect informed of orders placed and of their expected delivery for use in connection with the works.

Delays in obtaining materials, equipment, fittings, etc. or non availability of same is at the entire risk of the Contractor and will not be considered for extension of time.

1.6 SUPPLY OF SAMPLES

The Contractor shall allow for furnishing any sample of materials, workmanship or building components that may be required by the Architect for approval or selection including panels of rendering, blockwalls, painting, stone cladding, etc. The approved samples shall be retained on site in temporary room suitably protected and labelled for comparison with materials used in the works and shall be removed when no longer required at the Contractor's expense.

The Architect will reject any materials, workmanship or components which in his opinion is not up to the same standard of any previously approved sample and such material workmanship or component previously approved.

1.7 REPORTS AND RECORDS

The Contractor shall record daily the number of workpeople employed on the works in each trade together with details of delivery of materials on site and movement of plant and equipment to and from site as applicable.

He shall also keep daily records of weather conditions, and works executed and tests carried out.

The Contractor shall supply free of charge photostat copy of such records to the Project Manager / Architect at fortnightly intervals from the commencement to the completion of the works. Similar records shall be kept by the Contractor for all sub-contractors employed on the project.

1.8 PLANT AND EQUIPMENT

The Contractor shall provide and install all necessary plants, concrete mixers, vibrators, dumpers, excavators, bulldozers, rollers, pumps, cranes, hoist, ladders, scaffolding, staging, tackle, tarpaulins, tools, vehicles and other plant (mechanical and otherwise) and allow for altering, adapting, and maintaining them as necessary for the efficient and expeditious execution of the works and at or before completion clear same from building and site and make all good, to the entire satisfaction of the Architect.

1.9 GENERAL COSTS

The Contractor shall allow for all costs incurred in respect of workpeople and site staff :-

(a) Workmen's Compensation Insurance

(b) National Pensions Fund Contributions

(c) Sick Leave, Annual and Public Holidays

(d) Shut down or account of cyclone warnings, weather conditions, inclement weather, etc.

(e) Travelling time expenses, fares and transport costs.

(f) Incentive and Bonus Payments

(g) Severance and Subsistence Allowance

(h) Protective and Safety clothing and equipment.

(i) Any other costs necessary under the application of the Building Industry Remuneration Order and the Labour Act.

The Contractor must make himself acquainted with current ordinances and Government regulations regarding the movement of housing, security and control of labour, labour camps, transport, etc. and make allowance for all costs incurred therewith or arising from the employment of workpeople and site staff.

1.10 WORKING RULES & REGULATIONS

The Contractor shall conform to all Regulations, By Laws and other requirements of the Local and Central Administration. He shall give all notices and pay all fees legally demandable by such Administration. If anything shown on the drawings or mentioned herein conflicts with such regulations, the Contractor shall inform the Architect and obtain his instructions before proceeding.

1.11 HOARDING, BARRICADES AND SCREENS, GANTRIES

The Contractor shall provide and erect temporary hoarding, gantries, barricades and screens with gates, access doors and fastenings, for the proper execution of the works, for the protection of the workmen, public and occupants of the adjoining premises and for meeting the requirements of any local or other authority.

The whole of the site shall be properly fenced with temporary hoardings and shall be removed and cleared away from site on completion of works, all to Architect's satisfaction.

1.12 SHORING

The Contractor shall provide for upholding sides of all exposed excavated surfaces with timbering shoring or other methods approved by the Architect.

The construction and efficiency of the shoring for the purpose for which it is erected shall be the entire responsibility of the Contractor. Should any subsidence or any other damage occur due to the inefficiency of the shoring or any other support provided, the damage shall be made good by the Contractor at his own expense.

1.13 MAINTAIN AND PROTECT PUBLIC PROPERTY ETC

The Contractor shall maintain and protect public and private carriageways, footing, kerbs, pipes, duct, sewers, service mains, underground and overhead cables, etc. and keep approaches to the site clear of mud throughout the execution of the works, and make good or pay for the reinstatement of any damage caused either directly or indirectly by the execution of the works even if done by nominated suppliers of Sub-contractors to relevant Authorities satisfaction at the Contractor's expense.

1.14 WATCHING

The Contractor, from commencement to completion of he works both day and night including Sunday and Public holidays, shall allow for all necessary watching for the security of the works.

1.15 POLICE REQUIREMENTS

The Contractor shall allow for ascertaining and complying with police requirements and for all costs in connection therewith.

1.16 ANNOYANCE TO NEIGHBOURS, ETC.

The Contractor shall allow all costs in connection for executing any work which in the Architect's opinion is likely to cause annoyance or inconvenience to neighbours in the vicinity, at such times during normal working hours as the Architect may direct.

1.17 OVERTIME

If the Contractor deems it necessary to execute work outside normal hours in order to complete the works by the prescribed date or for any other purpose, he shall obtain the consent of the Architect before doing so.

1.18 ACCESS FOR INSPECTION AND MEASUREMENTOF WORKS

The Contractor shall provide at all times during the execution of the works and the Defects Liability Period proper means of access, with ladders, gangways, etc. and necessary attendance to move and adapt same as directed for the inspection or measurement of the works by the Project Manager, Architect / Quantity Surveyor or his representatives.

1.19 TEMPORARY LIGHTING

The Contractor shall provide all necessary artificial lighting and power for the execution and security of the works and for the protection, with all meters, temporary wiring and fittings, etc. pay all charges and alter, adapt and maintain the temporary works as necessary, and remove and make good at completion.

1.20 TEMPORARY BUILDINGS ETC.

All temporary buildings, etc. shall be situated in approved positions. The Contractor shall provide the following :-

- Proper sheds, etc, for the storage and protection of materials, goods, tools etc, and for the execution of work which may be prepared on site.
- Proper sheds and messrooms for the workpeople.
- All necessary sanitary accommodation for the workpeople and site staff and shall deodorize the ground after removal.
- All other amenities, etc, in accordance with the Building Industry Ordinance and Construction Regulations.
- Offices for the Contractor's staff.

1.21 NOTICE BOARD

The Contractor shall allow for supply and erection of a suitable name board displaying.

(i) Title of project

(ii) Name of Employer

(iii) Name of Project Manager / Architect / Engineer / Quantity Surveyor

(iv) If the Contractor wishes names of Contractor and Sub-Contractors

Layout of the name board size and type of lettering shall be approved by the Architect.

1.22 ACCURACY OF WORK

The whole of the Works shall be constructed to achieve levels of accuracy within the permissible deviations recommended in BS 5606 unless specified otherwise.

The Contractor shall ensure that all materials, elements and components of the building fit together as designed. Work which fails to meet the specified levels of accuracy must not be rectified without approval. The Contractor shall submit proposals for such rectifications and meet all costs arising, including effects on other work. However, should approval not be given thereby necessitating removal and replacement of the work, the Contractor shall do so at his own expense.

1.23 SETTING OUT

The Contractor shall set out the Works using methods and measuring instruments described in BS 5606 and shall inform the Architect when overall setting out is complete and before commencing construction.

The Contractor shall allow for providing all necessary instruments and assistance for checking the setting out and levels.

The Contractor shall check all dimensions and levels both on drawings and site, particularly the correlation between components and work in place and shall not order materials or any components or carry out the work until any discrepancies if any have been resolved with the Architect.

Details of all grid lines, setting out stations, bench marks and profiles shall be recorded on the site setting out drawing and retained on site throughout the contract and handed over to the Architect on completion. The cost thereof is deemed to be included in he Contractor's rates.

1.24 PREPARATION AND KEYING OF BASES AND BACKGROUNDS

The Contractor shall ascertain the nature of the surface, after which the backgrounds shall be prepared and keyed where necessary in accordance with :

(a) the recommendations in any applicable British Standard and Code of Practice documents.

(b) the specification and recommendation of the Manufacturer of the materials to be laid thereon or applied or fixed thereto.

(c) best building practice

so as to be suitable to receive and, where keyed, to ensure adhesion of the materials to be laid thereon or applied and fixed thereto.

1.25 ADHESIVES AND FIXINGS GENERALLY

Where and to the extent that the types of adhesives and fixings and / or types, sizes and spacings of fixings are not fully specified they shall be suitable for the intended purpose having regard to the nature of and compatibility with the materials being fixed and fixed to ; the size and weight of the fixture and the conditions under which it can reasonably be expected to be used; the specifications and recommendation of the Manufacturer of the adhesive or fixing, the material being fixed, the material being fixed to.

Adhesives and fixings shall conform to the latest requirements in any British Standard or Codes of Practice document or Mauritian Standards and be used in accordance with :

(a) the specification and recommendation of the Manufacturer.

(b) the recommendations in any applicable British Standard or Code of Practice documents or Mauritian Standards.

(c) best building practice so as to retain the fixture securely in position.

1.26 PRICING

All rates inserted in the Bills of Quantities shall cover all costs, charges and profit that may be considered necessary for the carrying out and observance of the provisions of General Specification unless otherwise specified.

1.27 DISCREPANCIES

During the progress of the works, the Contractor shall satisfy himself as to the correctness of all drawings and measurements. If the Contractor finds any discrepancy in the drawings or between the drawings and the specifications, he shall immediately refer the same to the Architect who shall decide which shall be followed. Figured dimensions shall be taken in preference to the scale mentioned on or attached to any drawings.

1.28 WORKING DETAILS

Two copies of all drawings and of the Specification shall be furnished by the Architect, free of cost to the Contractor for his own use. The Architect shall furnish to the Contractor within a reasonable time after the receipt by him of a written request for the same, any details which in the opinion of the Architect are necessary for the execution of any part of the work, such request to be made only within a reasonable time before it is necessary to execute such work in order to fulfill the Contract. One copy of the drawings, details and Specifications shall be kept on the Works until the completion thereof and the Architect or his representatives shall at all reasonable times have access to the same. All copies of the drawings, details and specifications shall be returned to the Architect by the Contractor on he completion of the Contract.

1.29 DATUM

The levels of the works are related to the Employer's survey plan. All temporary bench marks required by the Contractor for the execution of the works shall be provided by the Contractor at his own expense.

1.30 PROGRAMME AND PLAN OF OPERATIONS

The whole of the works to be constructed by the Contractor under this Contract shall be completed within the time stated in the tender documents.

The Contractor shall, before commencing work on site, submit to the Project Manager/ Architect, for his approval, a full detailed programme showing the order of procedure and method by which he proposes to carry out the construction and completion of the works, and particulars of the organisation and staff proposed to direct and administer the performance of the Contract. The Project Manager / Architect may ask the Contractor to amend the programme at this or any other time.

The works shall be carried forward to completion with the greatest possible expedition, to the satisfaction of the Project Manager / Architect, in accordance with the programme.

1.31 UNITS

All quantities in the Bills of Quantities, Specifications and the Drawings are given in the "System International D'Unités" (SI Units).

1.32 TEMPORARY WORKS

After the Contract is awarded and before the works on site commence, the Contractor shall submit to the Architect, for his approval, drawings showing the proposed location and general arrangement of his offices, workshops, stores, quarters, access roads and other temporary works required for the proper and expeditions execution of the permanent works.

The Contractor shall allow for paying all rates and other charges which may be made by local or other authorities in connection with temporary buildings erected for the purpose of the Contractor.

Use of existing building as temporary building by the Contractor shall only be made with the consent of the Architect, but with the understanding that the Contractor shall be responsible for any damage incurred and for reinstating the premises to their original condition to the entire satisfaction of the Architect.

1.33 PRIVATE ACCESS

The Contractor shall obtain his own information with regard to access to all parts of the site of the works if he wishes to make use of routes through private property then he must make all arrangements with the owners. The Condition of the surfaces of the private roads, paths or yards used or crossed by him by sub-contractors or by nominated suppliers for the purpose of the contract shall be kept clear of mud and in reasonable repair during its progress and on completion he shall put the roads, paths or yards in proper repair at least equal to the original condition of the roads, paths or yards used or crossed by him and to the satisfaction of the Architect, all at his own cost. In general, the Contractor is to regular the character of his transport to ensure that no undue damage is caused to any roads, tracks or properties within the area of the works, public or otherwise.

1.34 CONTROL 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.

1.35 CARE OF WORKS

He will be held responsible for the care of the existing premises and the works generally until their completion, including all work executed and materials, goods and plant (including those of sub-contractors and suppliers) deposited on the site, together with all risks arising from the weather, carelessness of workpeople, damage or loss by fire, theft, cyclone or any other cause; and he shall make good at his own expense all such damage or loss.

The whole of the temporary works, plant, equipment and appliances used on the works will be the liability of the Contractor in regard to construction, sufficiency, safety, maintenance and removal on completion of the Contract and approval by the Architect shall in no way relieve the Contractor of this liability.

1.36 PROTECTION FROM WATER AND SEWERAGE

The Contractor shall keep the whole of the works free from water and sewerage and accept all risks of flooding in view of the high water table or from any cause whatsoever. The Contractor shall provide and maintain the necessary pumping plant to deal with all water and sewerage which may flow into trenches or excavations and shall allow in his prices for such plant, pumping, shoring, temporary drains, sumps, etc and shall clear away and make good at his own cost and to the satisfaction of the Architect any damage caused.

1.37 EXISTING SERVICES

The Contractor shall make such provisions as may be required by the authorities concerned for the support and protection of any water, main, sewer, telephone cable, power cable or other services met with on the site. Any diversion of those existing services including protection thereof shall be treated as variation under terms of the Contract, but should the authorities concerned prefer to carry out the work with their own workmen the Contractor shall be paid net amounts plus five per cent on such work. The Contractor shall pay such amounts and recover the costs through payment certificates.

1.38 DAMAGE TO ESSENTIAL PUBLIC SERVICES

In the event of the Contractor damaging water, sewerage, electricity or telephone services, whether these have been marked or not, the Contractor shall immediately inform the authority concerned and advise the Architect without delay and the cost of making good damage shall be at the expense of the Contractor.

1.39 EXPLOSIVES AND BLASTING

The use of explosives for blasting for any purpose whatsoever shall not be permitted on this Contract.

1.40 SITE OFFICE FOR THE ARCHITECT

The Contractor shall erect, maintain for the duration of the Contract and remove on completion, one furnished and well ventilated office on site and shall provide full time attendance for general cleaning duties.

The office shall be subject to Architect's approval with appropriate meeting table and chairs for a minimum of 10 persons for convening meetings and other site works on a regular basis.

1.41 COVER UP AND PROTECT

The Contractor shall cover up and protect the works from the weather and suspend all operations during weather conditions, which, in the Architect's opinion, would be detrimental to the works.

1.42 CLEARING AWAY

The Contractor shall take down and clear away all plant and temporary work, including sheds, messrooms, sanitary conveniences, offices etc, unless otherwise described and make good.

The Contractor shall remove all existing rubbish and debris and surplus materials from the site as they accumulate and at completion and clean all surfaces, internally and externally, remove stains and touch up paint work and polished work, and leave the works clean and to the satisfaction of the Architect at completion.

SECTION 2- DEMOLITION / ALTERATION / RENOVATION

2.1 Notwithstanding the provisions of Clause B.5.1 of the principles of measurement (International) for works of construction, June 1979, all materials described as "set aside for re-use and or salvaged materials" shall become the property of the Employer unless otherwise specified. The Contractor shall allow for cleaning, transporting and storing on site unless otherwise specified as directed by the Architect. All other demolition materials shall be understood to become the property of the Contractor and shall be cleared away and disposed off site.

2.2 Demolition works comprise of demolition of items, removal with care of components, units as specified, cutting of existing structures, making good to disturbed existing structures, finishes, including shoring and supporting to same, all to Architect's satisfaction.

SECTION 3- EXCAVATION AND EARTHWORK

3.1 INSPECTION OF SITE

The contractor is deemed to have visited the site and to have ascertained the nature of the soil, type of rock, bedrock and the like to be excavated and shall be responsible for making his own judgement as to the nature of the ground and subsoil and carrying out any trial pit or other site investigation.

The Contractor must however use his own judgement as to whether conditions revealed by trial pits are consistent over the whole site.

3.2 ORIGINAL GROUND LEVELS

The levels shown on the various drawings relate to Ordinance Datum unless otherwise stated.

The Contractor shall be responsible for setting up and maintaining a site datum level accurately ascertained from this work.

Should the Contractor not be satisfied with the accuracy of the levels indicated on the drawings, he must give written notice thereof to the Architect before any work is commenced, otherwise no claim in respect of inaccuracy of levels will be entertained.

3.3 STARTING LEVELS

The term "Formation level" shall be deemed to be the surface of the ground after reduced level excavation stripped level or after filling to make up levels.

In preparing the Bills of Quantities it has been assumed that, unless otherwise described, the Contractor will carry out the stripping and or reduced level excavation before proceeding with any other items of excavation; the Contractor may execute the work in any order he wishes, but no consequent adjustment will be made to the measured quantities and any re-measurement will be carried out on the same basis as the original measurement.

Any excavation through deposited earth from previous excavation will be entirely at the Contractor's own expense.

The term "Original Ground Level" shall mean the existing ground level, as per the contour of the surveyed plan provided by the Architect / Employer.

3.4 LIABILITY FOR EXCAVATIONS

Notwithstanding any authorisations, approvals or directions given by the Architect with regard to excavations or any matter connected therewith, the Contractor shall be responsible for taking the necessary safety precautions and for any damage arising from the operations.

Excavations shall be carefully planned and executed to ensure that boundary walls, adjacent property and trees are adequately supported at all times and their safety shall be the Contractor's responsibility. No tree roots shall be left uncovered during excavation.

3.5 TOP SOIL

Top soil retained on site for reuse shall be kept in separated spoil heaps and protected from contamination by subsoil, cement, broken concrete, aggregates and the like or by petrol and other substance likely to impair the growing qualities. Topsoil shall not remain unused for more than 12 months unless the topsoil is overturn to prevent it becoming stale. Weed growth on topsoil heaps shall be controlled by chemical means to prevent soil becoming polluted by weed seeds. All top soil all to be spread as directed by the Architect.

3.6 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. Care must be taken, especially if ground dewatering equipment is used, that covering of the ground water table in the vicinity of the excavations or extraction of fine particles o soil from surrounding ground causes no damage to adjoining property.

3.7 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.

3.8 UNDERPINING (WHERE APPLICABLE)

Underpinning of the existing buildings on sides of the new structure shall be carried out as per details on the drawings and further instruction on site by the Engineer. No excavation for the new base etc., will start before completion of underpinning. Excavation shall be to the widths and depths shown on the drawings or as instructed by the Engineer. Any excess excavation shall be made up with concrete grade15, as directed by Engineer.

3.9 PLANKING AND STRUTTING

Where necessary sides of excavations are to be secured by planking and strutting to Engineer's approval at no extra cost.

3.10 EXCAVATION DIMENSIONS

The excavations are to be executed to the widths and depths of the concrete or other foundations required 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 be at his own expense fill in such widths or depths beyond that instructed or shown with concrete Grade 15 to the satisfaction of the Engineer.

3.11 ROCK

"Rock" means any hard material, bed rock, rock strata which in the opinion of the Engineer can be removed only by use of compressors, wedges, special plants or explosives 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 classified as rock may, if approved by the Engineer, be used as hardcore filling but broken to gauge as approved by the Engineer.

3.12 BLASTING

No blasting will be permitted.

3.13 TRIMMING EXCAVATION IN SOIL

The lower 100 mm of soft material in the bottom of excavation shall not be removed until immediately before placing concrete.

3.14 TRIMMING EXCAVATION IN ROCK

The faces and bottom of excavations in rock shall be cleaned of all loose material to the satisfaction of the Engineer by brushing or washing with waterjets before placing concrete. Any extra concrete required to make up level `and or instructed by the Engineer as a result of this unevenness of the faces and bottoms of such excavation shall be deemed to be included in the rates for the items of excavations and or concrete related thereto.

3.15 COLLAPSE

Should any ground fall in due to the omission or insufficiency of earthwork support or due to any cause whatsoever, it must be dug out and removed or disposed as directed and the excess excavation should be filled up with concrete grade 15 to Engineer's approval, all at the expense of the Contractor.

3.16 NOTICE

The contractor is to give not less than 24 hours notice to he Engineer when excavations are complete and no concrete shall be cast until the excavation have been inspected and approved in writing.

3.17 MATERIALS FOUND IN EXCAVATIONS

No material found in the excavations is to be used in the works without the written permission of the Engineer.

3.18 FILLING

Filling under floors or paving shall consist of approved local field stone graded to max 150 mm size placed in layers not exceeding 225 mm thick. Each layer shall be watered and well rolled and compacted by a ten tonne roller or as approved by Engineer.

Hardcore filling is measured nett and to compacted thickness. No allowance has been made for decrease in bulk after compaction.

Top layer of the hardcore shall be levelled or graded to falls as required with crusher run and blinded with 15 mm layer of washed rocksand, well watered and rolled to receive concrete as described.

Handpacking of hardcore to form vertical or battered faces, sinhings and compactive of bottom of excavation, formation level shall be deemed to be included in the rate of filling, unlesss otherwise specified.

Backfilling around foundations shall be with selected excavated material free from deleterious material laid in layers not exceeding 200 mm thick, well compacted and consolidated.

3.19 AREAS OF CAVES IN FOUNDATIONS

In the event of caves found in the foundation, the Engineer shall instruct the Contractor to carry out site investigation by rotary core drilling at selected places in the excavations to locate the areas of the caves and filling the same with concrete grade 15 by a specialist subcontractor to the Engineer's satisfaction.

3.20 DIMENSIONS AND LEVELS

The Contractor is to submit to the Quantity Surveyor with all necessary levels, formation levels, levels or top of blinding layer, as approved by the Engineer.

3.21 EARTHWORK SUPPORT

Earthwork support, as an item has been provided in the Bills of Quantities for the Contractor to price earthwork support which shall be deemed to include the provision of everything necessary for adequately maintaining the sides of all excavations and for keeping excavations clear of all fallen materials, rubbish or debris and boards or coverings as required. This item shall be not subject to Adjustment for whatsoever.

3.22 RATES FOR EXCAVATIONS

The rates for all excavation including the excavation for drains and service ducts shall include :

1. Excavating in any type of soil, including rock, bedrock, rock strata and including excavating below ground water levels or below water level.

2. Breaking up and removing any existing foundations, walls, slabs, footings tarmacadam paving, existing tracks below ground level or any other obstructions encountered during the course of the excavation.

3. Excavating in ground interspersed with boulders, rubble filling or waste material and grubbing up, cutting back and sealing off old service mains, pipes cables, timber and drains or other obstructions.

4. Excavating next to existing roads, footpaths, existing buildings, existing services and around existing services etc. The cost of any necessary measures to be taken in such instances shall be borne by the Contractor.

5. For the disposal of the excavated material to a suitable tip to be provided by the Contractor and or multiple handling of the excavated material.

6. For excavating and trimming the final 100 mm down to formation level by hand immediately prior to concreting.

7. For trimming sides, levelling and ramming bottoms and forming steppings unless otherwise described.

8. For trimming faces and bottom of excavation in rock, including cleaning as described.

9. For removing all ants, pests, termite nests or other parasites over area of site and backfilling

10. For all necessary barricades and watching and warning, lighting and protection.

11. Any additional excavation that may be required beyond the net width of the structure for working space, timbering or other temporary work, formwork to sides of foundations and any subsequent backfilling.

SECTION 4 - CONCRETEWORK

4.1 ENGINEER'S SPECIFICATION

The whole of the concrete work shall be specified in the Engineer's specification included in the Tender Documents. The Engineer's specification shall take precedence over this standard specification in so far as they relate to structural matters. The Contractor is to allow in his rates for all items therein. In the event of the Contractor leaving any item unpriced, he will be deemed to have considered that his rates are adequate to enable him to perform the services and obligations as described in the Engineer's Specification without extra charge.

4.2 CODE OF PRACTICE

All workmanship, material, tests and performance in connection with the reinforced concrete work shall be in strict compliance with the latest edition of British Standard Code Practice CP 110. "The Structural use of Reinforced concrete in Buildings" where not inconsistent with the preambles.

4.3 CEMENT

Cement for use in the works shall unless otherwise specified, be Ordinary Portland Cement to BS 12. It shall be fresh and free from lumps or partly set particles. Cement, which in the opinion of the Engineer is sub-standard, shall be rejected and removed from site.

Cement shall be stored in watertight shed the floor of which shall be raised clear of the ground. Consignments shall be used in the order in which they are delivered.

4.4 WATER

Water used for mixing concrete shall be from an approved source, clean fresh, free from acid, oil, pollution from industrial or farmyard waste or other organic or inorganic matter in solution or suspension in such amounts as to impair the strength or durability of the concrete.

4.5 AGGREGATES

Aggregates shall conform to the requirements of BS 882 and samples of all aggregates shall be submitted to the Engineer for the approval before work commences. Fine aggregates shall consist of one part of washed coral sand and two parts of coarse rock sand or such other proportions as the Engineer may authorised The sand shall be clean, strong, durable and free from salt, earth loam, dust, organic matter or other deleterious substances. It shall be graded with the limits specified by BS 882. Fine aggregated shall be washed and / or sieved if required by the Engineer at no extra cost.

Coarse aggregates shall be crushed blue basalt stone obtained from an approved source. The aggregates shall be roughly cubical in shape, clean, hard, non porous, free from dust, laminated or flaky pieces and any impurities in materials which may adversely affect the strength or durability of the concrete. It shall be graded in accordance with BS 882 for its respective nominal size.

If coarse aggregates conforming to the above grading are not reasonably obtainable, the Contractor shall supply two or more sizes of otherwise satisfactory aggregates and if approved the aggregates shall be stored on site separately for each size and mixed in proportions to be directed by the Engineer at no extra cost.

Aggregates shall be stockpiled on paved areas or boarded platform in separate units to, prevent intermixing. On no account shall aggregates be stockpiled on the ground.

4.6 CONCRETE PROPORTIONS AND MIXING

Unless otherwise directed or specified, concrete aggregates shall be measured by volume in accurately made and approved gauge boxes to the proportions specified and / or shown on the drawings.

Cement shall be measured by weight. One or more complete bags of 50 kg shall be used for a single batch of concrete. The cement and aggregates shall be mixed for at least two minutes after the water has been added. Only sufficient water to produce dense concrete of adequate workability shall be added.

One or more of the following grades of concrete as specified on the structural drawings shall be used:

Grade 35	1:1:2
Grade 30	1:1.8:2.8
Grade 25	1:2.4:3.8
Grade 20	1:2.7:4.2
Grade 15	1:4:6

Unless otherwise specified coarse aggregates for the above mixes shall be graded from 10 mm to 20 mm. However, 10 mm to 35 mm-graded aggregates may be used in mix grade 15 &10 subject to the approval of the Engineer. Slump of the concrete shall not exceed 60 mm.

4.7 CONCRETE PLACING AND CURING

Concrete shall be placed in its final position in the moulds or forms within 20 minutes of mixing and shall not be subsequently disturbed. Concreting shall be carried on continuously up to predetermined construction joints as directed by the Engineer. It shall be placed in layers and worked around the reinforcement to fill all corners of the formwork.

All reinforced concrete shall be compacted by an approved type of vibrator, but shall not be over vibrated to bring cement and fine aggregate to the surface.

As soon as possible after the initial set has taken place all exposed concrete shall be covered as directed by Engineer and kept constantly wet for at least seven days.

4.8 CONCRETE TESTS AND STRENGTHS

Unless otherwise instructed the Contractor shall provide at his own cost for the making and testing of concrete test cubes in accordance with BS 1881, in standard steel moulds. The cubes shall be forwarded to an approved testing authority at 7 or 28 days. The contractor shall keep a record of all cubes made with details of cube markings and test results. A copy of this record shall be submitted to the Engineer when each test result is received.

The concrete strengths as determined by the test tubes shall give the following minimum strengths for each grade specified.

Grade	Nominal Mix	Minimum 7-day strength	Minimun 28 Day strength
		N / mm²	N / mm²
35	1:1:2	24	35
30	1:1.8:2.8	22	30
25	1:2.4:3.8	17	25
20	1:2.7:4.2	14	20
15	1:4:6	10	15

The strengths above are the minimum acceptable crushing strengths at 7 and 28 days. The average crushing shall be at least 10% above the minimum strength.

4.9 CONSTRUCTION, EXPANSION AND CONTRACTION JOINTS

Construction joints in concrete shall be made only at positions predetermined and agreed with the Engineer. Concrete shall be placed continuously until completion of the work between construction joints. Such joints shall be truly vertical or horizontal as the case may be, except that in inclined members the joints shall be right angles to the axis of the member. Vertical and inclined joints shall be formed by using temporary stop boards. The provision of such boards shall be deemed to be included in the Contract Sum and joints shall not be measured as shuttering. A record of all construction joints shall be maintained by the Contractor and a record copy to the Engineer. Floor slab and beams shall be cast in one operation .

Construction joints shall be formed at distance not greater than 12 metres. No concrete shall be poured at this formed joints be the lapse of 48 hours. The spacing between construction joints ground floor on hardcore shall be not greater than 6 metres. Ground floor slabs shall be cast before walling above.

Expansion and contraction joints shall be formed in the positions to the details shown on the drawings.

4.10 DEFECTS IN CONCRETE

Any honeycombing, cavities or other defects in concrete shall on account be patched or repaired but shall be brought to the attention of the Engineer who will give instruction for the action to be taken. All remedial works shall be at the Contractor's expense.

4.11 FORMWORK

All formwork and shuttering shall be of sound timber or other applicable material and of adequate sizes, strength and construction to with the loading from the placing and consolidation of concrete without distortion, springing or other movement. All joints shall be sufficiently tight to prevent leakage of cement grout and to avoid the formation of fins or other blemishes.

The following minimum intervals of time shall be allowed between placing concrete and removal of shuttering:

	Days
Beam sides walls and columns	2
Slabs with props left in place	7
Removal of props to slabs	14
Beam soffits with props left in	10
Removal of props to slabs	14
Cantilever beam and slabs with props left in	14
Removal of props to cantilever beams and slab	21

The contractor shall be responsible for any injury to the work any consequent damage by or arising from premature removal of shuttering centering or supports.

4.12 CONCRETE COVER TO REINFORCEMENT

Unless otherwise directed or shown on the drawings, concrete cover to reinforcement bars in any face shall be: The greater of the diameter of the bar or the following dimensions:

Foundations against earth	75mm
Foundations against blinding	50mm
Columns and ground beams (links)	30mm
Beams (links) and walls	20mm
Slab	15mm

The specified concrete cover shall be maintained by the use of 50 x 50 concrete spacer blocks made with 1:11/2" cement and sand mortar, which are cast length of 18 SWG annealed wire for tying to the reinforcement bars. Such spacer blocks shall be so spaced as to ensure a constant cover to the reinforcement bars, but in no case shall the spacing exceed 1.00 m in any direction.

For hollow pot slabs spacer blocks shall be of the correct size to give the specified width of rib.

4.13 STEEL REINFORCEMENT

The steel reinforcement shall comply with the latest requirements of the following British Standards:

Round Mild, Medium Tensile and High Tensile Steel Bars	to MS 10
Hot rolled deformed bars for the reinforcement of concrete	to MS 10
Cold twisted steel bars	to MS 10
Fabric reinforcement	to BS 4483
	to BS 4482

It shall be in metric sizes as detailed on the drawings. It shall be in lengths not exceeding 12 metres. No claim on account of non availability of reinforcement in specified lengths will be entertained; price of reinforcement in schedule of rate shall include for cutting, bending and all wastes.

All reinforcement shall be free from oil, grease, dirt, paint and loose rust scales, etc., and the Contractor must allow for cleaning wire brushing, etc. as necessary to achieve this. All steel bars must be cut and bent cold in accordance with BS 1478 and to the dimensions shown on the drawings.

Steel reinforcement shall be accurately placed in position as shown on the drawings and shall secured against displacement during concreting by using 16 SWG annealed binding wire or suitable clips at all inter – sections. Concrete or metal supports, spacers or metal hangers shall be used to ensure that the correct position of the steel bars and specified cover is maintained.

The contractor shall give a minimum of two days notice to the Engineer of his intention to concrete any portion of the works to enable an inspection of the reinforcement and shuttering to be made. The carrying out of any such inspection will in no way relieve the Contractor of his responsibility for fixing the reinforcement in accordance with the drawings or the provisions indicated therein and to ensure the specified cover. Any failure in the concretework where the reinforcement is found to be not in accordance with the drawings or the provisions indicated therein and to ensure the specified cover.

Any failure in the concrete work where the reinforcement is found to be not in accordance with the drawings or not in the correct position will be the sole responsibility of the Contractor. Such liability will include for any consequential delays in completion of the works or any claims arising whatsoever and for the repair of the structure as directed by the Engineer.

4.14 FABRIC REINFORCEMENT

Fabric reinforcement shall be electrically cross-welded steel wire and reinforcement to BS 1221 or 4483 and of the size and weight specified.

The fabric shall be free from scale, rust, grease or other substance likely to reduce the bond between the steel and the concrete and shall be laid with minimum laps of two spacing in both directions and bound with No 18 SWG annealed iron wire. The Contractor is to include in his price for providing such laps.

4.15 POSITION OF ELECTRICAL CONDUIT

Unless otherwise instructed by the Engineer all electrical conduits to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top bottom steel layers in slabs and similar members. Conduit runs over 25 mm diameter shall be approved by the Engineer before the conduit if fixed.

4.16 TOLERANCES

The surface of the concrete shall be finished to a wood float finish to the levels, falls and crossfalls, as directed or shown on the drawings and shall be subject to the following tolerances:

1. The level shall be within + or – 6 mm of the levels directed.
2. The falls shall be within 10% of the falls directed.
3. The smoothness shall be such that departures from a 3.0 m straight edge laid in any direction shall not exceed 3 mm.

Minor irregularities shall be made good by the use of a steel float but in no circumstances shall mortar be used to make good the surface.

4.17 PRECAST CONCRETE

Precast concrete shall be cast in properly made strong moulds true to the shapes required. Formork described as "fairface" the moulds shall be lined with hardboard, sheet metal or other approved material. The concrete shall be thoroughly vibrated into the moulds and shall not be removed from them until seven days of placing the concrete, but the sides may be removed after two days providing the concrete is not damaged by so doing.

The precast work shall not be cast under cover and shall remain under the same for seven days after removal of the moulds. During the whole of this period the concrete shall be protected by the hessian or other approved material kept wet. It shall then be removed from the cover and stacked in the open for at least seven days. All angles and prominent parts are to be suitably protected from damage during the execution of the works.

4.18 FILLER BLOCKS (for hollow for slabs)

Precast concrete hollow filler blocks shall be to the shapes and sizes as shown on the drawings and shall comply with Bs 2028 and of strength or gross area of 3.5 N / mm². The ends of the block facing beams shall be filled in for 25 mm depth.

4.19 WATERPROOF CONCRETE

Where "waterproof concrete" is required, unless otherwise specified, Sika Waterproofing Compound or other approved to be added to the mixing water strictly in accordance with the Manufacturer's instructions and unless otherwise directed.

4.20 WATERBAR

Waterbar shall be PVC waterbar or equivalent of approved manufacture and shall be provided in the positions indicated on the drawings.

Joints shall be heat welded in accordance with the Manufacturer's instructions. Where the waterbar is to be fixed vertically, approved metal clips shall be provided to suspend the waterbar from the reinforcement. Formwork supporting waterbar or used to form a starter containing waterbar shall be carefully constructed and to the exact details shown on the drawings.

No concreting will be permitted to portions where upstand starters form an integral part until the formwork to the starter has been fixed and approved by the Engineer.

4.21 CHASES AND HOLES

Form of all chases, holes, etc. in concrete work as required by other trades and make good thereafter.

4.22 CONCRETE SURFACE FINISH TO FLOORS

Where a tamped finish for concrete surfaces is specified, the surface shall be a levelled and floated uniform plain or ridged finish which shall not be disturbed in any way after the initial set and during the period of curing; surplus concrete being struck off immediately after compaction. Any additional cement mortar required shall be allowed therein to obtain the uniform plain or ridged finish.

Where a wood float finish is specified floating shall be done after the initial set of the concrete has taken place and the surface has hardened sufficiently. The concrete shall be worked no more than is necessary to produce a uniform surface free from marks. Any additional cement mortar required shall be provided as before described.

Where hard smooth steel-trowelled finish is specified trowelling shall not commence until the moisture film has disappeared and the concrete has hardened sufficiently to prevent excess laitance from being worked into the surface. The surfaces shall be trowelled under firm pressure and left free from trowel marks. Any additional cement mortar required shall be provided as before described.

Where the surface is to be power floated smooth it shall be carried out by mechanical means and skilled operatives. On completion the surface shall be checked to ensure that the final finish is within 5 mm of required levels and shall be smooth and dense and free from marks and similar imperfections. The finished surface shall be adequately protected against damage by subsequent trades as agreed with the Architect. Any additional cement mortar shall be provided as before described.

If specified floor hardener type Multi Dura or equivalent shall be provided at the rate of 7 kg/ m^2 or as recommended by the Manufacturer subject to Architect's approval.

4.23 FORMWORK FINISH

Formwork may be of steel or timber and will be specified for use in accordance with the following classifications:

Type A- Formwork intended for use in forming concrete faces with special surface features which will not be covered by any other finishes and shall be such as to impart to the resultant concrete face as for Type B formwork. Board marked feature shall be achieved with the use of wrot timber boards to the pattern as shown on the drawings.

Type B- Formwork intended for use in forming concrete faces which will not be covered other than by painting, if at all shall be such as to impart to the resultant concrete face a finish equal to that which would result from the use of plywood faced shutter boards or special steel forms which are new when concreting commences and thoroughly cleaned after each use. The Architect may require that parts of the concrete be rubbed down with a carborundum stone to finish clean and smooth without trace of shuttering marks or any disfigurements. The term "Type B Formwork Finish" shall deem to mean "Fair Face Formwork" unless otherwise specified.

Where this class of formwork specified to be used to form the soffits of slabs or the faces of walls, the arrangement of panels shall be symmetrical, set out from edges or centre lines. Odd dimension fill-in panels shall be cut to size and symmetrically place in approved positions. All joints between shutter panels shall be straight and tight to approval.

Type C- Formwork intended for use in forming concrete surfaces which will not be covered other than painting, unless otherwise specified, shall be obtained from the use of closely jointed wrot timber boards, shutter board or new steel shutters and which shall be properly designed to Architect's approval. The resultant concrete surfaces shall be improved by carefully removing all fins, projections, thoroughly washing down and filling blemishes with cement and sand mortar paste;

The treatment of the surfaces should be carried out carefully in order to ensure that the finished concrete surfaces are not permanently stained or discoloured.

The term "Type C Formwork Finish" shall deem to mean "Off shutter Formwork" unless otherwise specified.

Type D- Formwork intended for use in forming concrete faces which will be plastered or covered with tiles, or other similar finishes shall be such as to impart to the resultant concrete face a finish equal to that which would be obtained by the use of sawn timber or ordinary steel plates. The term "Type D Formwork Finish" shall deem to mean "Sawn Formwork" unless otherwise specified.

Face Groove or rebate formers

Where shown or noted on the drawings, forming grooves or rebates, approved plastic and or wrot timber or similar material shall be inserted in or between formwork elements to soffits or faces in such a manner as to form grooves, rebates in the concrete to obtain a class B finish formwork. The grooves or rebates shall be straight, to true lines and arranged in approved patterns.

4.24 MEASUREMENT AND PRICING FOR CONCRETE

All costs incurred by the Contractor for complying with the provisions concerning the preparation and use of graded mixes shall be allowed herein.

All rates for concrete shall include for mixing 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.

Rates for concrete work shall include for all labour and material for forming all construction and day joints and kickers.

Prices for concrete are to include for all necessary curing.

Concrete in small projections, hoods, nibs, fins and the like unless otherwise described is included in the relevant concrete item to which they are attached.

Concrete poured against faces of excavation and beds laid on earth and or stone are measured to nett volumes. The Contractor shall allow in his prices for any formwork or extra concrete he may consider necessary for such times.

Notwithstanding the provisions of Clause C4, 1.4 of the principles of measurement (International) for works of construction, Formwork to sides of foundations is not measured and shall be allowed for by the Contractor in his rates for concrete if he so desires.

4.25 MEASUREMENT AND PRICING OF FORMWORK

The term "formwork" is to be taken to include centering, casing, shuttering and the like. Rates for all formwork shall include for fitting together in the required forms, hoisting, struting, shoring, staging, bracing and wedging, plumbing and fixing to true surface and angles, all straight and raking, cuting, splayed edges, notchings, holes for electric conduits, service pipes, etc., cutting and fitting around projecting pipes and continuity bars and the like, narrow widths and small quantities nails, bolts, clamps, wedges, including waste in cutting, overlaps and passings, and properly fixing at intersections, cleaning out before concreting, maintaining in position for the period directed, easing, striking and removing.

The formwork is measured to the actual net area in contact with the finished face of concrete.

The Contractor shall allow in his rates for formwork for forming all grooves or rebate, projections as shown or noted on the drawings and as required at all formwork joints.

The cost of the formwork required to form construction joints and the like, which may be necessary to uphold the concrete during the operation and setting is deemed to be included in the rate for concrete.

Notwithstanding the provisions of Clause C4.1 item 3 of the Principles of Measurement (International) for works of construction formwork to sloping upper surfaces of concrete shall be measured only where the slope is in excess of 45 degrees from horizontal. In all other cases, the Contractor must allow in the prices for the concrete for any formwork he considers may be necessary.

4.26 MEASUREMENT AND PRICING FOR REINFORCEMENT

Reinforcement is measured by computing its theoretical mass from the nominal size and lengths stated on bar bending schedule in line with the structural drawings as approved by the Engineer, no allowance being made for waste, rolling margin, support, stools spacers or tying wire or for cutting to lengths.

The Contractor shall also allow in his rates for wire or other material required for binding or supporting the reinforcement as well as that of bending, hooking and all other work in providing and fixing the reinforcement as shown on the drawings or as specified.

The Contractor shall allow in his rates for fabric reinforcement for the extra material at laps, for cutting the fabric to the sizes required, and for bends, binding wire, stools, distance blocks and waste.

Notwithstanding the provisions of Clause C 3.2 of the Principles of Measurement (International) for works of construction, reinforcement bars of differing diameters are grouped together irrespective of location.

SECTION 5 – BLOCKWORK

5.1 CONCRETE BLOCKS

Concrete blocks shall comply with BS 6073: Part 1:1981 for strength, drying, shrinkage, moisture content curing and mix.

Concrete blocks shall be generally Grade A type (3.5 N/mm²) unless otherwise specified.

Concrete blocks shall be obtained from an approved manufacture and the size of the blocks shall be 457 x 203 x 200 or 150 or 100 mm. Blocks of dissimilar dimensions will not be accepted, half length blocks shall be used where required to break bond.

5.2 MORTAR MIXES

Cement mortar to be used shall be composed of cement and sand (1:3) with an approved plasticiser as per manufacturer's specification unless otherwise specified. All mortar shall be measured in specially prepared gauge boxes and thoroughly mechanically mixed with water added until all parts are completely incorporated and brought to a proper consistency. Small quantities of mortar may be mixed on platforms subject to Architect's approval.

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

5.3 SETTING AND JOINTING

All blocks shall be lightly wetted immediately before being bedded and jointed to minimise absorption of water from the mortar. Top of walling where left off shall be well-wetted before recommencement of block lying.

Blocks are to be well buttered with mortar as previously specified. The blocks shall be laid, in stretcher bond with 10mm thick, joints full, flushed up and grouted solid joints. The joints shall not vary by more than 3 mm and shall achieve the specified height in specific number of courses shown on the drawing. The work shall be carried out with horizontal joints truly horizontal and level. The vertical joint shall be 10 mm thick with approx. 3 mm tolerance. No vertical joint in any course shall be within 110 mm of a similar joint in the course immediately above or below unless otherwise shown. Joints shall be raked out where surfaces of walling are to be plastered.

No extra claim of labour and or material whatsoever shall be entertained by the Employer due to non availability of specified sizes of the concrete blocks. The Contractor shall build to the specified height floor to floor by cutting the concrete block and or placing extra concrete height of the beams at his own expense. The adjustments of mortar joint shall not be permitted.

5.4 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 900mm higher at one time than the other part and in such cases the joining shall be made in long steps so as to prevent cracks arising and walls shall be leveled around at each floor.

All putlog holes shall be carefully, properly and completely filled up with concrete grade 25 on completion of walling work.

All walling shall be properly protected while mortar is setting.Wall shall be kept thoroughly wet for at least three days or for longer period of time as the Architect may direct. Walls exposed to the sun shall bc protected with hessian, which shall be kept wet.

5.5 REINFORCEMENT IN BLOCKWORK

Provide for reinforcing blockwork vertically in hollow core of block and horizontally in mortar joints as specified and where indicated on the drawings.

Provide wall ties at tee and right angle junctions at every three courses as shown on Engineer's drawings or as specified.

Provide doors and window jamb with 1 Y10 mm reinforcement in 1 hole of blockwork, and filled with concrete grade 25, all as shown on Engineer's drawings or as specified.

5.6 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 fixed with metal lugs and void to metal frame shall be filled with cement mortar well compacted.

5.7 FIXING BLOCKS AND LEAVING HOLES

Provide and built into walls all necessary fixing blocks and leave cut away as necessary holes and chases for pipes conduits and the like and make good after fixing by other trades and specialists.

5.8 BUILD IN LUGS AND THE LIKE

Form of leave mortises 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.

5.9 PRICES FOR BLOCKWALLING

The Contractor must allow in his rates for blockwalling for plumbing angles, rough cutting whether straight raking or splay and waste, cutting and or filling with concrete grade 25 under soffit of beams and slab split courses necessary for bond, bonding at angles, intersections junctions of walling of different thickness, cutting and fitting columns, cutting and pining to beam, cutting and fitting around end of cills and lintels, cutting and pinning ends of structural timber, steel sections and the like and also shall include for wall ties at angles, junctions and tees as shown on drawing or as specified.

The rates of blockwork must also include for fixing all door, window like openings, forming reveals to same and for cutting and waste to walling in short lengths to mullions and jamb of openings.

The rates of blockwork must also include for hoisting and building off slab and beams at any level, all necessary scaffolding and for work built overhand and building in of items as described.

SECTION 6 – STONEWALLER

6.1 CEMENT AND SAND

Cement and sand for this trade shall be as specified for "concrete".

6.2 MORTAR FOR MASONRY WORK

Mortar for bedding and jointing of stonework shall be composed of cement and sand (1:3) mix with an approved plasticiser as per manufactuer's specification unless otherwise specified.

6.3 STONEWORK IN WALLS

All stones for use in walling, cladding shall be of approved local fields stones of blue or other colour 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 shall be well bonded and all voids filled in the solid with mortar as described. Excessive gaps between adjacent stones shall be filled with smaller stones to match with all the stonework. Wall to be laid at random i.e uncoursed.

Mortar joints shall be raked to a depth of 25 mm from face of stonework for an open joint finish as a dry stone wall appearance or finish flush pointed with cement mortar with matching colour pigments.

All stonewall faces, angles, features, returns reveals shall be dressed to true lines, and levels, accurately plumb and true in vertical plane.

For fully dressed stonewall and or cladding, the joints shall be fine joints or invisible joints to all exposed surfaces unless otherwise specified.

6.4 BONDING

All walls shall be constructed with all materials fully bonded and or tied together, and joints filled, to ensure compliance with design requirements for stability and strength.

Appropriate galvanised malleable ties, shall be provided to backing wall as per Contractor's design as required and to Architect's approval.

6.5 SAMPLE STONEWORK PANELS

Allow for constructing two sample stonework panels approximately 2 sq m each 450 mm thick for stone masonry wall, and 150 mm thick for cladding on blockwalling background and approved sample panels shall form the standard to be maintained throughout the contract.

6.6 COPINGS

Copings to top of stone walls shall be dressed on all exposed faces.

6.7 PROTECTION

The stone wall shall be properly protected from mortar droppings, etc, and kept clean and neat as the work proceeds and the whole of the stonework shall be wirebrushed and cleaned down to the satisfaction of the Architect on completion. Should the contractor be unable to clean the wall from mortar droppings etc., to the satisfaction of the Architect, he will be required to re-execute the work to he extent which the Architect may deem necessary at no extra cost.

6.8 RATES AND MEASUREMENTS

The Contractor shall allow in his rates for walling for all plumbing angles, rough cutting whether straight, raking or splay and waste, split courses necessary for bond, bonding at angles, intersections and junctions of walling of different thickness, forming solid tops under beams and soffits of slabs for forming joints as specified, forming any split course and cutting and fitting around ends of cills and lintels or other members, cutting and pining ends of structural timbers, steel sections, forming all door, window or other openings including forming reveals to same and for all cutting and waste to walling to short lengths to mullions or jambs of openings; for hoisting and building off beams ad slabs at any level, all necessary scaffolding and for work built overhand and building in of items a described.

Rates for stonewalling shall include for all dressing to external angles, features, reveals returns and for galvanised wall ties.

SECTION 7 – ROOF COVERINGS

7.1 ROOF WATERPROOFING

The whole of the roof waterproofing works shall be carried out by a specialist firm approved by the Architect / Project Manager. The roof waterproofing shall be generally laid on screeded surfaces with an approved double layer, the bottom layer being minimum 2.5mm thick and the top layer being minimum 2.5 mm thick of bituminous roof waterproofing membrane on sealer coat and hot laid with melted oxidised bitumen executed by specialist strictly in accordance with the manufacturer's instructions and shall carry an irrevocable ten year guarantee with the terms and conditions as approved by the Architect / Project Manager. The guarantee shall be deposited with the Architect / Project Manager on issue of the Practical Completion Certificate. The waterproofing treatment shall be applied over all expansion joints, parapets, upstands, flashings and dressed into all rainwater heads.

All surfaces to be waterproof shall be inspected by the Specialist who must satisfy himself that the surfaces are slope and are in a perfect state to take the waterproofing. All the surfaces shall be cleaned and prepared as required by the Contractor at his own expense.

SECTION 8 – CARPENTRY AND JOINERY

8.1 STRUCTURAL TIMBER

All structural timber in the works shall be according to BS 4978 and shall be treated Kempas, keruing, Gurjun, Mahogany or other approved type.

The timber shall be imported good, sound, well seasoned vacuum impregnated with tanalith salts Type C at the rate of 64 kgs per cubic metre of timber, free form all defects and shall be worked to the full sizes indicated on the drawings.

8.2 TIMBER FOR JOINERY

Timber for joinery shall be Dark Red Meranti or equivalent unless otherwise specified conforming to BS 1186 for quality and workmanship.

8.3 TREATMENT OF TIMBER

The ends and backs of all doors, frames and all timbers built in, resting or in direct contact with walling or concrete where not exposed to view, shall be coated with two coats of creosote, solignum or other approved preservative.

8.4 REPLACEMENT OF DEFECTIVE TIMBER

Should any of the timber warp, shrink, wind or develop any other defect the same shall be removed and new fixed in its place and at the Contractor's sole expense together with all other work that may be effected.

8.5 PREPARATION OF TIMBER

The preparation of 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 sun and weather.

8.6 CONSTRUCTIONAL TIMBER

All constructional timber shall be properly jointed and framed together and secured with dowels, bolts or spiked as indicated on the drawings.

8.7 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 made joints. 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 eliminate joints.

Actual dimensions of scantlings for carpentry shall not vary from specified dimensions by more than 3mm in deficiency or excess.

8.8 JOINERY WORK GENERALLY

All joiner's work generally to be cast and framed together as soon is practicable after the commencement of the building but shall not wedged or glued until the building is ready for fixing same.

All work to be properly tenoned, shouldered, wedged, pinned, braided etc. as directed by and to the satisfaction of the Architect and as 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 wise described.

8.9 FINISH TO

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

8.10 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 information and guidance of artisans before commencing the respective work. All joints, ironwork and other work connected there fully delineated which said setting out will be required to be suit to the Architect and approved before such respective works are completed.

All mouldings shall be accurately and truly run and all work planed and finished to the approval of the Architect. All arrises to be pencil rounded.

Should any of the joinery work shrink, warp wind or develop other defects before the end of the defects liability period, the same be removed and new 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 shall be formed by Rawlplastic Philplug screwfix or other approved patent material. No woodplugs shall be used.

Any fixed joinery which in the opinion of the Architect is liable become bruised or damaged in any way shall be properly cased and tested by the Contractor until the completion of the works.

8.11 DOOR FRAMES AND LININGS

Door frames and linings shall be constructed to the sizes and details shown on the drawings. Joints between stile and head shall be mitred.

Doorframes shall be fitted with three fixing galvanised irons to each side of the frame and one at the head. Frames for double doors shall have two fixings at the head.

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

6mm diameter galvanised metal dowels shall be fixed to each end of the frames 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 lintel the same number as for fixing irons to frames.

8.12 **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. 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.

8.13 **PLYWOOD**

Shall be to the specified thickness and shall comply with BS 1455. Plywood shall be Grade 1 whether varnished or painted. Concealed side of plywood can be Grade 2 .

8.14 **BLOCKBOARD**

Shall be to thickness shown on drawings and shall conform to BS 3444 and 3583.

8.15 **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.

8.16 **SCREWS**

All screws to be used for the joinery works shall be rustproof and shall conform in every respect to BS 1210.

8.17 NAILS

These shall be galvanised mild steel wire nails – all in accordance with BS 1202.

8.18 MOISTURE CONTENT OF TIMBER

The Contractor is to ensure that the moisture contents of the various items of joinery delivered to the site are appropriate to the conditions of use to which the components are to be put.

8.19 SHRINKAGE

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

8.20 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 move shall be adequately compensated.

8.21 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, screw nails and other fixings that may be instructed by the Architect or may be necessary for the proper execution of the joinery works. The joining shall also carry out all works necessary for the proper construction of all framing, linings, etc. and for their support fixing in the building.

8.22 JOINTS

The joinery shall be constructed exactly as shown on the Architect details. Where joints are not specifically indicated they shall recognised forms of joints for each position. The joints shall made so as to comply with BS 1186, Part 2: 1971

Loose joints are to be used where provisions must be made for shrink or other movement acting other than in direction of the stress fixing or loading.

Glued joints are to be used where provision need not to be made for shrinkage or other movements in the connections and where sealed are required.

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

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

Glued joints surfaces in contact are to have a good swan or 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 sad or glass paper must not be allowed to clog and cause 'burnishing'.

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

Adequate pressure should be applies 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 moisture content is always less than 16 per cent can be case in or organic glues.

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

8.23 SCRIBING

All skirting, 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.

8.24 FLUSH DOORS

Flush doors shall be semi – solid cored and shall be lined on both sides with 4mm Grade 1 plywood for painting, unless otherwise described.

The doors shall be lipped with 8mm thick hardwood strips on four sides and shall be fitted and hung to frames as detailed on drawings and specified previously .

Doors shall otherwise conform to BS 459 Part II

8.25 WORKING PROCEDURE

(a) Measurements for Joinery

The Contractor is to take all measurements for joinery works on site to the building and not from the architect's drawings, except where the work is specified to be "built-in" .

(b) 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 groundwork 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 the 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. Vertically 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 floors, wall and ceiling surfaces have been formed or constructed, unless otherwise specified.

(c) Joinery Assembled insitu

Where joinery works are specified to be "assembled in site" 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 fitted – in solid with plaster or concrete.

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

(d) Drawings

Work is not to commence until the Architect has approved the manufacture full-size setting out drawings. Suggestions, which the manufacturer may wish to make for modifying the construction and joints shown on the Architect's drawings, will be, and considered when the shop drawings are examined.

(e) Inspection

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

(f) 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 and dry out.

(g) 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.

(h) 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.

8.26 IRONMONGERY

Butts and hinges 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 ironmonger shall be fixed before the woodwork or metal work is painted. Handles shall be removed carefully stored and re-fixed after completion of painting. Locks shall be oiled and left in perfect working order. All locks to include two keys and or three keys and all keys shall be labelled with door references marked on plastic labels before handing to the Architect on completion.

8.27 PRICES OF TIMBER WORK

The Contractor is to include in his prices of all members for fitted ends, miters, housings, returned ends, etc. and for short-lengths not exceeding 30mm.

The prices for all joinery items are to include for pencilled rounding all arrises and all labour for crossgrain.

Where hardwood is described as screwed, prices are to include for pellating with a matching hardwood.

Allowance is to be made in the prices for angles, ramps, mitres, ends, etc. on timber worked on solid and shall include for all necessary non-ferrous metal screws, metal cramps, dowels and the like.

The prices for all timber described as select quality are to allow for keeping clean for light coloured finishes, polishing, etc.

SECTION 9 – METALWORK

9.1 GENERALLY

Metal Work shall be of mild steel complying with BS 4360, and shall be hot dipped galvanised to BS 729 Part I minimum 610 gm/m², unless otherwise specified. Locally welded joints, if approved, shall be treated with epoxy zinc rich primer to Architect's satisfaction.

Bolts, nuts and screws shall be in compliance with BS 916 or BS 1494 as appropriate. Bolts, nuts and screws shall be of sizes as shown, with hexagonal heads and nuts and washers as required.

Rivets shall be countersink at all bearings joints and where required.

Stainless Steel shall comply to BS 1449 of BS 4127 and shall be generally of marine grade, type 316.

All metal work shall be delivered to the site clean and tidy, free from rust, putting or any corrosion.

9.2 STEEL WINDOWS

All steel windows shall be from galvanised sections or hot dipped galvanised after manufacture. A sample window shall be submitted to the Architects for approval before any order is placed. All sectional frames, casements and glazing bars to be free from flaws and other imperfections.

All steel windows and doors and frames shall be constructed in FX 6 and FX 8 section with tee glazing bars as specified.

All top, bottom and side-hung opening casements, unless otherwise described or shown on the drawings, are to be hung on stout steel pivot hinges with gunmetal centres.

All top hung opening fanlights and casements, unless otherwise described or shown on the drawings, are to be fitted with brass peg stays with pegs arranged to lock window when closed.

All side-hung casements, unless otherwise described, or shown on the drawings, to be fitted with brass handles and pivot with night ventilating notches to engage with striking plate and adjustable brass sliding stay.

All horizontal and vertical pivot hung sashes are to be fitted with approved bronze friction centres capable or adjustments and fitted with brass fastening, unless otherwise described or shown on the drawings.

Steel doors with frame and sash frame are to be as described. Kicking plates and other solid plates are to be of 3 mm galvanised mild steel pressed and bent to profile and fixed on locks and furniture to be as described and to have generally two keys. Each leaf of doors is to be fitted with two 150 mm brass square pattern tower bolts.

All large windows are to be provided with temporary braces or stiffeners to prevent coupling screws or sections being strained during transit, hoisting and handling. After windows are built in and prior to glazing, each window must be carefully tested and adjusted to ensure that opening sections are in perfect working order, make good contact and are watertight and that glazing bars are perfectly aligned.

9.3 NACO LOUVRES

Naco louvres shall be in galvanised steel or anodised aluminium with an anodising of not less than 20 microns and shall be obtained from an approved manufacturer. A sample louvre shall be submitted to the Architects for approval before any order is placed.

Naco louvres shall be complete with fixing screws, plugs, weatherstrips at heads and sills and all necessary fixing accessories. Composite openings of 1000 mm high and above shall be provided with aluminium mullions 6 mm x 50 mm as the manufacturer's recommendations and shall be fixed by means of retaining brackets with 4 screws each head and cill and bolted to the louvre channels.

Naco louvres shall be glazed with either 152 mm x 6 mm clear float glass louvre blades with two long edges bevelled and polished.

The whole of the naco louvres shall be fixed in accordance with the manufacturer's instructions.

9.4 PRESSED STEEL DOOR FRAMES

Pressed steel door frames are to be of minimum 1.60 mm (for once rebated frames) and minimum 1.20 mm (for twice rebated frames) made up with mild steel, hot dipped galvanised after manufacture pressed and bent to profile to shape, mitred and welded at angles and provided with six approved steel lugs (three to each jamb) with fishtailed ends and flanged for building into walls. Frames described as suitable for fixed or opening fanlights are to have transomes of similar steel with welded seams at edges and ends tenoned into and welded to frames. Frames are to be fitted with solid plates or bracing bars across bottom.

Unless otherwise stated, each frame is to be fitted as described with approved heavy steel butts welded on. Each frame to doors fitted with a mortice lock is to be slotted for bolt, correctly positioned and to have a mortice cap welded on at back of perforation. All necessary drilling for sundry ironmongery such as fanlight openers, bolt sockers, etc. should be executed by the steel frame manufacturers at the works and the Contractor is to undertake to supply the correct information to the manufacturer to ensure that this is done. All frames are to be fitted with a pair of anti-slam buffers.

Fixings for set-crews are to have a solid welded on at back in all cases. All steel frames are to be thoroughly cleaned free from rust, scale, etc., and to be primed of delivery to the site.

9.5 ROLLER SHUTTERS

Roller shutters shall be in galvanised mild steel plates of 18 S.W.G sheets and be obtained from an approved manufacturer.

Shutters shall be complete with guides, channeled mannual gear, gearbox, lock Cyclone bars are to be provided where the width of roller shutters exceeds 2.80 m.

Roller shutters are to be designed, manufactured and fixed to withstand the basic wind speed of minimum 280 km/hr. Calculation to be submitted to Engineer for checking purpose, prior to manufacture.

9.6 ALUMINIUM OPENINGS

Aluminium Openings shall be to BS standards or equivalent and shall generally be powder coated finish minimum 60 microns to BS 6496 (powder coating to be guaranteed for ten years). Aluminium opening shall be strictly to manufacturer's specification and to Architect's approval and shall be made up with extruded aluminium profiles, and if approved by Engineer reinforced with galvanised infills to resist a basic wind speed of 280 km/hr. Glazing shall be generally with clear float glass minimum 6 mm thick, properly set in neoprene gaskets. Perimeter of openings shall be pointed with elastometric silicone mastic minimum 6 mm thick and 10 mm deep, all around internally and externally. All joints are to be mitred, and openings shall watertight and dust proof all as recommended by manufacturer. Doors shall be fitted with approved heavy duty mortice lock, handle powder coated finish unless otherwise specified, and 1 ½ pairs of heavy duty stainless steel to each door leaf hinges. Windows shall be in heavy duty friction hinges, with heavy duty powder coated fasteners. All ironmongeries shall be to BS Standards and to Architect's approval. Contractor will be required to submit sample of openings, of a miniature type, complete with ironmongeries to Architect, supported with all technical literature from manufacturer for approval prior to placing order, unless otherwise specified.

The Contractor shall be responsible to cover all exposed aluminium opening surfaces with protective paper or the like during erection and after installation against damage, staining, abrasion and or other injuries. On completion the contractor shall remove all protective material and clean the surfaces to Architect's satisfaction. No abrasive agents shall be used.

9.7 FIXING AND ERECTION

All openings including doors and windows shall be inspected for damage on arrival on site and any damage shall be made good as described.

All seatings and surrounds shall be checked for line, level and bolt setting before commencement of fixing Errors which cannot be accommodated without distortion shall be brought to the attention of the Architect. Drifting or burning of holes will not be permitted.

9.8 FREEDOM FROM SURFACE DEFECTS

All welded fillet or butt joints shall be ground smooth and shall be free from porosity, cavities and entrapped slag before hot dipped galvanising.

Welds which are to be hot dipped galvanised shall be neatly formed and the surfaces shall be acceptably free from cracks in the welds or heat affected zone, from overlap, undercuts, porosity, entrapped slag and spatter in or associated with the welds. The welds shall seal completely the edges of all overlapping or contacting surfaces.

The profile of the weld shall be uniform of approximately equal leg length and free from overlap at the toes of the weld. Unless otherwise specified, the surfaces shall be either flat or slightly convex in the case of fillet welds and with a reinforcement of not more than 3 mm in the case of butt welds. The weld face shall be uniform in appearance throughout its length.

9.9 TEMPORARY BRACING OF METAL WORK

The Contractor shall be responsible for whatever temporary bracing is necessary. Upon completion of the works all temporary bracing, brackets, cleats and the like shall be removed and all surfaces made good or painted as specified.

SECTION 10 – PLASTERING, SCREEDING, WALL AND CEILING FINISH

10.1 GENERAL

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 receive decoration. If 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.

10.2 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.

Concrete floors and roofs receiving screeds shall be hacked to form a good key, well washed and wire-brushed perfectly, well wetted and painted with a cement and sand (1:1) grout immediately before commencing screeding work.

All surfaces for rendering shall be well wetted with a hose before rendering is applied .

10.3 CEMENT

Shall be as specified previously.

10.4 SAND

Shall be as specified previously for fine aggregates, but in addition shall be in accordance with BS 1199 and shall have three washings if coral sand is used.

10.5 MIX FOR RENDERING

The mix for rendering both internally and externally shall be composed of cement and sand (1:3) mix plus an approved mortar plasticiser used strictly in accordance with the manufacturers' written instructions.

10.6 APPLICATION OF RENDERING

External rendering shall be not less than 16 mm or more than 20 mm in thickness.

Internal rendering and rendering to soffit of slabs, concrete beams shall not be less than 13 mm or more than 16 mm in thickness unless otherwise specified.

Moulds, weathering, projections, sunk bands and other architectural features shall be executed in accordance with the drawing to a true line finish and are to include for any dubbing out.

Internal angles are to be coved to a radius of not more than 25 mm.

The surface of internal rendering shall be steel trowelled to a smooth, even and true finish.

The surfaces of external rendering shall be finished to a true even surface with a wood float and to a sponge textured finish.

External rendering generally at joints between beams, columns and blockwalling must be watertight. Contractor shall also provide a minimum of 250 mm wide strip of waterproofing membrane as per Specialist and with chicken mesh (where applicable) to joints between infill blockwalling and soffit of beams and to joints between blockwalling and sides of structural columns of concrete frame structural building. This treatment must be to Architect's approval. The rates and prices of rendering work must include for watertightness of these aforesaid joints as specified.

Rendering shall be returned into reveal soffits of openings, margins and sunk bands and the like, with strong and true arises and all angles shall be true and straight with salient angles rounded.

All rendered surfaces shall be free from blemish. All cracks, blisters and other defects shall be cut out and made good and the whole left perfect on completion.

All rendered surfaces be kept damp and moist for at least two days on completion of he rendering work.

10.7 TYROLEAN FINISH

Tyrolean renderings shall consist of two coats, with a backing coat of 12 mm thick made up with cement and sand mortar as before up to an even and true surface followed by a tyrolean finishing coat of cement and sand for a suitable mix applied with a special spraying machine and built up in three coats to a total thickness of 8mm approx. to the approval of the Architect.

10.8 ROOF SCREED

Provide for laying a cement sand screed 1.3 mix plus plasticiser and to which may be added an approved quality waterproofing compound in accordance with manufacturer's specification, if specified.

Minimun screed thickness if not specified shall be 13mm and the maximum to be as necessary to provide adequate falls to rainwater outlets and to ensure that no water ponds on the roof. All loose screed will be removed by the Contractor and a new screed laid on epoxy compound.

Screeds shall be laid to falls and crossfalls and shall be dished towards rainwater outlets.

Where roofs are to be waterproofed, provide for inspection of roof by specialist waterproofer and obtain signed statements that roof falls are acceptable. No waterproofing work should be allowed to commence before being accepted in writing by the waterproofing specialist.

10.9 QUARRY TILING

Quarry tiling shall be to the quality, sizes and colour as selected by the Architect, laid to area 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 surfaces shall be polished on completion of the contract.

10.10 WALL TILING

Wall tiling shall be executed with ceramic glazed earthware tiles conforming to BS 1281 of approved Manufacture true to shape and free from blemishes unless otherwise specified.

The backing coat for wall tiling shall be finished perfectly true and not less than 10mm thick and not greater than 16mm thick in mortar of a mix of one part of cement to two parts of sand, the surface of which after 24 hours shall be combed or scratched and left for a further 24 hours. When still slightly green the surface shall be well wetted and the wall tiles after soaking in water for 30 minutes and left to drain shall be bedded on the backing coat with a similar mixture of cement and sand as for the backing coat. The tiles shall be laid perfectly level and finished proud of the surrounding rendered wall surfaces. Internal and external angles and round edged tiles are to be of the same manufacture, colour of thickness as the foregoing. All joints to run perfectly straight both horizontally and vertically. The joints between the tiles are to be pointed in neat matching colour tile adhesive.

10.11 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 finished executed in the work and shall conform to the respective approved samples.

10.12 PRICES FOR SCREEDS, PLASTERS, TILING, ETC.

Prices for paving 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 temporary dividing strips, and curing 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, mitres and for short lengths not exceeding 300mm, mitre cut to tile edge or for PVC tile trim at angles where specified.

Prices for 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, V-joints, working to rebates making good to window or door frames, around pipes, holderbats, 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, cill, etc., all of which have been included in the general term of walls.

SECTION 11 – GLAZING

11.1 QUALITY OF GLASS

All the glass to be of the best quality obtainable free from all defects and imperfections and shall be to the approval of the Architect.

11.2 WINDOWS AND DOORS

Glaze all windows and doors in suitably thick clear sheet glass unless specified otherwise.

11.3 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.

11.4 PUTTY

Putty for glazing to wood shall be made of pure whiting and raw linseed oil and to be used fresh. Putty of 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 of necessary. No mineral or other oils shall be used in the putties except genuine linseed oil.

The rebates of metal window shall be painted one coat before puttying.

11.5 GLAZING

All glass to be cut accurately in one piece, to fit easily into their rebates and to be well puttied, back puttied 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 externally and neatly splayed off externally all mitres and angles left clean and sharp.

11.6 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.

SECTION 12 – PAINTING

12.1 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.

12.2 MATERIALS, PAINT, VARNISHES, ETC.

All oil paints, emulsion paints, varnish and other materials shall be of an approved manufacture and to Mauritius Bureau Standards or B.S Standard or as specified and shall be used strictly in accordance with the manufacturer's instructions. The Contractor will only be allowed to use materials which are brought to the site in sealed cans, bearing the name of the manufacturer and properly labelled as to quality. Exterior quality paints only shall be used, both internally and externally unless otherwise specified. All cans of paints must be kept well stirred before and during the work and mix with approved admixture as recommended by the Manufacturer. All coats of paint applied over each other shall be from the same manufacturer and the type recommended by the manufacturer.

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 material shall be used without the express permission of the Architect.

12.3 PREPARATION OF SURFACES

All surfaces to be painted shall be thoroughly cleaned down and surfaces of wood to be sandpapered 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 white bushes or other approved method. Galvanised, sheradised or zinc sprayed metal to be painted shall be treated with mordant solution and application of two pack etch primer. Copper pipes specified to be painted shall be rubbed down and clean as recommended by manufacturer.

12.4 WOOD PRESERVATIVE

Treat all timber built in or in contact with walling and concrete with 2 coats of approved type of wood preservative.

12.5 GALVANISED METAL SURFACES

Clean down, treat with galvanised iron cleaner, apply two pack etch primer, one coat of Universal undercoat, two coats of hard gloss enamel paint.

12.6 **IRONWORK**

Clean down, removing every trace of rust and paint one coat red lead primer, one coat of undercoat and two coats of gloss finishing.

12.7 **RENDERED SURFACES**

Brush down to remove dirt and dust, prime with alkali resistant as specified by the suppliers of the emulsion paint to be used and three full coats of approved PVA emulsion paint MS 3 standard (external quality) internally and externally strictly in accordance with the manufacture instruction.

12.8 **WOOD SURFACES**

Prepare, knot and stop and sand down all timber surfaces, apply on coat of undercoat and two coats of oil paints on surfaces of timber.

Unless otherwise stated, teak veenered doors shall be prepared, sand down and varnished with three coats of varnish.

12.9 **LIME WASH**

Rub down thoroughly by brushing, scraping or sand papering, remove fill crack and imperfections with universal emulsion filler.

Whenever stated, lime wash shall be applied three full coats to concrete blocks surfaces. Lime wash shall be glued type and shall be applied in accordance with manufactures' instruction.

12.10 **CLEANING ON COMPLETION**

All floors to be twice washed, all marks of paint to be sponged of windows cleaned, the works generally to be touched up after all the trades are finished and the whole of the building left clean and on the completion to the satisfaction of the Architect.

SECTION 13 – PLUMBING INSTALLATIONS

13.1 GENERAL

All materials and workmanship shall comply with the latest editions of the British Standard's Specification, Codes of Practice, Bye-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 as and when required by the architect. The drawings shall be based upon the Architect's diagrammatic drawings and shall be submitted in duplicate progressively at least one month prior to the programmed commencement of the work for co-ordination and approval of the Architect. All alterations to drawings, whether due to co-ordination 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.

All completion 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 drawing 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.

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 an then re-assembled by the Contractor.

13.2 SOIL VENTILLATING PIPES

Soil ventillating pipes shall be not less than 63 mm internal diameter rigid PVC pipes conforming to B.S.Standard and fitted with the necessary junctions and bends. The pipes shall be securely fixed to the wall with PVC clips and sheradised screws maximum 1.20 m centres.

Ventillating pipes shall be carried out at least 900 mm above eaves levels and shall be fitted with approved PVC grating.

13.3 RISING MAIN

The Contractor shall include for all charges fees and the like for tapping and connection to public watermain where applicable, including all necessary excavation and reinstatement of public roads.

13.4 WATER SUPPLY PIPEWORK

All internal and external water supply pipework, and the like with high density polythene pipe to BS Standard with socketed joints and associated fittings and ancillaries to manufacturer's written specification and to Architect's approval, unless otherwise specified.

13.5 WATER TAPS

All bib, pillar, 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.

13.6 STOPCOCKS

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 a pattern approved by the Architect.

13.7 WASTE PIPES

Waste from sinks and shower to be in 38mm bore pipe and from lavatory bassins to be 31mm. All wastes to be fitted with PVC bottle trap unless otherwise specified. All waste pipes shall be at each change of direction of pipe be fitted with a tee, one end with screwed plug for cleaning purposes. All pipes to be laid to fall.

13.8 SUPPLY OF SANITARY WARE

W.C's, bassins, sinks ad other sanitary units shall be of approved manufacture and shall comply with the relevant B.S.S. They shall be of a type and design approved by the Architect. The whole of the units shall be properly fixed and connected to the water service complete with wastes as described.

13.9 RAINWATER PIPES

Rainwater pipes shall be approved rigid PVC rainwater pipes to BSS unless otherwise described. Pipes shall be properly fixed to wall with approved clips at distances not more than 1.20 m centres. Roof outlet shall be fitted will fullbore PVC outlet with dome or flat PVC grating and fixed as per manufacturer's specification.

13.10 TESTING

The whole of the water installations must be tested by the Contractor and any defective work or part be made good or replaced immediately and shall be re-tested until found satisfactory. Testing should be carried out in whole or in sections as the proceed by means of adequate test pump to Architect's approval.

13.11 **COMMISSIONING**

Upon completion of the works, the Contractor shall issue a certificate stipulating that the installation has been examined and tested, it is according to specification and that it will operate and maintained efficiently.

When handing over the Contractor shall demonstrate to the Employer the methods of operation, limitations, the maintenance instruction and any other documents or information appropriate to the installations.

13.12 **PROTECTION**

All pipework shall be properly protected from damage during the course of the works and during the backfilling of any trenches or closing up of any ducts. Any pipework damaged due to non protection thereof shall be replaced by the Contractor at his own expense.

13.13 **BUILDER'S WORK IN CONNECTION WITH SERVICES**

Notwithstanding anything contained in the principles of measurement of works (International) for works of construction, June 1978, builder's work in connection with plumbing and sanitary installation has been given as an item.

13.14 **MEASUREMENT AND RATES**

Rates for pipes shall include for fixing as required, the provision of all plugs, screws and other fixings, for all pipe clips, holder bats, etc., short lengths, cutting and joints in the running length.

All taps, meters, sanitary ware, tanks, etc., shall include for jointing to pipes and prices shall allow for all necessary fittings, adoptors, connectors, bolts, flanges, sealing rings, etc. The Contractor shall also include for all testing as described and for complying with all bye-laws and regulations.

SECTION 14 - DRAINAGE INSTALLATION

All relative clauses in "Excavation" and "Concrete work" shall apply to Drainage Installation.

14.1 DRAINAGE EXCAVATIONS GENERALLY

All excavations shall be kept free from water at all times by means of pumping or baling and where the ground is loose or the sides of the excavation are liable to collapse, they shall be securely supported with planking or sheeting properly strutted and maintained as long as long as necessary. In the event of the excavations being taken out of deeper or wider than is necessary they shall be filled in at the Contractor's expense with concrete grade 15. All surplus excavations arising from the construction of any drainage works shall be spread and levelled to the Architect's requirements or removed from the site.

14.2 EXCAVATIONS FOR PIPE TRENCHES

The excavations shall be taken out to such lengths at the time as the Architect shall approve and no pipes shall be laid until the excavations have been approved.

The bottom of all excavations shall be such a width as to provide at least 150mm clearance between the outside of the barrel of the pipe and the face of the excavation and / or timbering. The bottoms of all trenches shall be trimmed to the correct level so that all pipes shall rest upon the full length of the pipe and hand holes shall be excavated for all sockets except where pipes are laid concrete

After the drains have been laid in grannular bedding and surround and tested the trenches shall be carefully filled in and great care must be taken to see that the drain pipes are not disturbed or damaged by stones and rocks and the remainder of the filling shall be made in 300mm layers. each layer well consolidated and rammed. Any depressions arising at or before the expiry of the contract period shall be made up to Architect's approval.

14.3 PIPES

Pipes for foul and storm drainage shall be rigid PVC of approved manufacture unless otherwise specified, cut, laid, jointed and handled strictly in accordance with the manufacturer's specifications with all necessary bends, angles, collars, etc. Diameters of foul drains shall be as shown on the drawings or as specified .

14.4 DRAIN PIPES FOR SOIL DRAINAGE

All pipes for soil drainage which include the conveyance of discharges from W.C's, basins, sinks, urinals, baths and showers shall be PVC pipes unless otherwise specified, include bends, junctions and tapers complying in all respects with BS 4660 and BS 5481.

14.5 LAYING OF DRAIN PIPES

The pipes to be laid in straight runs to even and regular falls and put together with great care strictly in accordance with the manufacturer's instructions.

14.6 FALLS IN DRAINS

All pipes except where otherwise shown shall be to the diameter and laid to as shown on the drawings, or as specified.

14.7 CONCRETE BED AND SURROUND TO PIPEWORK

Where, specified, concrete surround to be pipes shall be in plain concrete grade 20, all to Engineer's approval and cross sectional size as shown on drawing and or specified.

14.8 GULLEY TRAPS

Provide trapped gullies, complete with gratings in positions shown on drawings set on concrete bed under, be completely surrounded in concrete and jointed to drain as described.

14.9 MANHOLES

Manholes are to be constructed in the position shown on the drawing. The internal dimensions of the manholes shall vary according to their depth and shall be to Architect's approval. Manhole shall be built to size and details as shown on drawing or as specified.

Step irons shall be in malleable cast iron and shall be provided where shown on drawing and or specified and shall comply with BS 1247 and shall be placed at intervals of 450mm vertically with 300mm offset between alternative steps.

Manhole covers shall be as shown on drawings or as specified and will be in cast iron unless otherwise specified with frame set flush in concrete cover slab shall, bedded in grease and shall be of an approved type.

14.10 SOAKWAYS

Construct soakaways shall be located as shown on drawing in position approved by the Architect. Water from rainwater pipes to be first taken into catch pit below rainwater pipes and thence by 100mm diameter pipe to soakway. The soakaways are to be 900mm x 900mm x1500mm deep unless otherwise specified filled with stones and finished with a 200mm layer of 38mm macadam

Soakaway shall be provided with concrete kerb all around as specified.

14.11 SEPTIC TANKS

Septic tanks shall be constructed in position shown on the site plan in accordance with detail drawing.

14.12 INTERCEPTING CHAMBER

Intercepting chamber shall be constructed in position shown on the site plan in accordance with detail drawing.

14.13 DRAIN TESTING

All drainage runs shall be tested before trench 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 the expense of the Contractor, all to Architect's approval. All drains, manholes and the like shall be coved cleaned and flushed on completion.

PART II

CIVIL AND STRUCTURAL ENGINEERING SPECIFICATIONS

1.01 Concrete Blocks

Concrete cellular blocks shall be obtained from an approved manufacturer and shall have been manufactured in accordance with BS 6073 : Part 1 : 1981. The size of the blocks are to be 457 x 203 x 150 or 200. An average compressive strength from a sample of 10 blocks on gross area shall be as specified on the drawing. No individual block shall have a compressive strength less than 80% of the specified on gross area. Where compressive strength is not specified, the specified minimum strength will be 3.5 N/mm². The testing of the blocks shall be in accordance with Appendix B of BS 6073 : Part 1. Alternatively testing in accordance with Appendix B of BS 6073 : Part 2 may be allowed at the discretion of the Engineer.

1.02 Mortar

Cement mortar for laying blocks shall consist of a mixture of ordinary Portland cement and cleaned washed sand material as specified for the use of concrete in proportion of 1 part cement: 1 part coral sand: 3 parts rock sand by weight with an approved plasticiser in liquid form which shall be mixed and proportioned as specified by the manufacturer. In no case the proportion of plasticiser will be less than 100 cc per 50 kg of cement.

Alternatively mortar for laying of blocks shall consist of 1 part of ordinary Portland cement : 3 to 4 parts washed rock sand by weight, materials as specified for the use of concrete and an approved plasticiser in liquid form shall be mixed and proportioned as specified by the manufacturer.

The ingredient of mortar shall be measured by proper gauge boxes, or by weigh batcher. When measured by the gauge boxes the dry density of sand shall be taken as 1360 kg/m³ and of cement as 1440 kg/m³. The mixing by hand shal not be permitted. Mixing shall be by an approved mechanical batch mixer c capacity not less than 0.1 m³ (finished product).

1.03 Setting and Jointing

Mortar shall be used within one hour of mixing. The blocks shall be laid in stretcher bond with 10 mm thick joints. The joint shall not vary ± 3 mm and sh achieve the specified height in specific number of courses shown on drawings. The work shall be carried out with horizontal joints truly horizontal a level and no part shall be 4 courses above adjacent work during construct The vertical joint shall be 10 mm thick with ± 3 mm tolerance.

No extra claim of labour and/or material or whatsoever will be entertaine Clients due to non availability of specified sizes of concrete blocks. Contractor shall build to the specified height floor to floor by cutting the con block and/or placing extra concrete height of the ring beams. The adjustme thickness of mortar joint shall not be permitted.

No vertical joint in any course shall be within 110 mm of a similar joint course immediately above or below except where shown otherwise.

A written approval of the design engineering consultants is required by the Contractor for the following:

(1) Changes in position of load bearing walls

(2) Sizes of structural opening for doors, windows or others

(3) Cutting of a horizontal chase in the wall of length more than 900 mm and depth 20 mm

(4) Cutting of a vertical chase more than 25 mm wide x 20 mm deep

(5) Built in services in walls requiring cutting of the walls

(6) Number of length of cutting in walls for conduits, services, etc. in excess of 2 of nature mentioned in (3) or (4) above.

No pipes carrying hot water shall be embedded in masonry wall. All cutting in the walls for fixings of doors, windows, etc. shall be kept to minimum, meaning that fixings may be built with the courses of masonry. The damaged or displaced block shall have to be removed and made good before concreting ring beam above and/or rendering whichever is earlier.

1.04 Reinforcement for Blockwork

All external block walls exposed to rain and wind will be reinforced with brick reinforcement as shown for every third course and will be well anchored at ends and bends to r.c. wall ties or columns.

The reinforcement shown at the tee and right angle junctions of masonry with or without r.c. wall tie columns shall be built with the courses of masonry. The r.c. wall tie columns shall be concreted in heights not more than 6 courses of masonry along with the masonry. The construction of r.c. wall tie column will not be permitted ahead of construction of walls. The concrete to the r.c. wall tie column shall be class 25/20 nominal mix with slump not more than 50 mm unless otherwise specified on the drawing. The reinforcement to the r.c. wall tie column shall be as shown on the drawings.

Whenever removable panel for future door or window is anticipated, the same will be built with brick reinforcement at alternate courses and good bonding ensured to make the joints leak proof.

At the end of each working day of the masonry work, horizontal and verti joints on both faces shall be raked out 4 mm deep with a scraper. Faces of r.c. wall tie columns and ring beams shall be roughened and hacked with ch hammer between 16 hours and 32 hours after they have been concreted. T is essential for proper bond between rendering and walls.

The completed masonry work shall be cured continuously for 72 hours with water. Curing of masonry works shall start 4 hours after they have been laid.

1.06 Load Bearing Walls

Load bearing walls shall comply with British Standard BS 5628 : Part 1 : 1992 and BS 5628 : Parts 2 and 3 : 1985 where not inconsistent with these Preambles.

1.07 Fixing Blocks and Leaving Holes.

Provide and build into walls all necessary fixing blocks and leave out as necessary holes for pipes, conduits and the like and make good after fixing by other trades and specialists as required to the specialist's detail to achieve movement and watertightness.

1.08 Build in Lugs

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 as per structural dimensions of the schedule for doors/windows, the frames are placed, complete with lugs, the walling completed in concrete mix type C.

1.09 Damp-Proof Course

Unless and otherwise indicated on drawings provide a layer of 2-ply felt damp-proof course. Felt to be of a manufacture approved by the Engineer and to be laid on a 10 mm (minimum) 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 150 mm at all jointings and corners.

1.10 Measurements

The Contractor must allow in his prices for blockwalling for plumbing angles, straight and raking cutting, cutting under soffits, waste, split courses necessa for bend, bonding at angles, intersections and junctions of walling of differ thicknesses, cutting and fitting to columns, cutting and pinning to beam, cutti and fitting around end of cills and lintols, cutting and pinning ends of struct timber.

The rates of blockwork must also include for fixing all door, window and openings, forming reveals to same and for cutting and waste to walling in lengths to mullions and jamb of openings.

The rates of blockwork must also include for hoisting and building off beam slab at any level, all necessary scaffolding and for work built overhead.

SPECIFICATION FOR CONCRETE

SPECIFICATION FOR CONCRETE

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SPECIFICATION FOR CONCRETE

1.00 General

1.01 Scope

This specification shall apply to:

- non reinforced mass concrete, and reinforced concrete to the buildings including site works

1.02 Definitions

(a) The Contractor shall mean the Main Contractor or his appointed representative.

(b) Approved or accepted shall mean approved or accepted in writing by the Engineer.

(c) Architect/Engineer shall mean the approving authority such as the Architect, the Engineer or their appointed representative.

(d) Satisfactory shall mean to the satisfaction of the Engineer.

(e) Required shall mean required by these specifications and/or by contract documents.

(f) Submitted shall mean submitted in writing to the Engineer by the Contractor.

(g) Instructed shall mean instructed in writing by the Engineer.

(h) Failure to comply with specification shall mean failure to comply satisfactorily with all or any of the requirements of these specifications and the contract documents.

(i) Exposed construction shall mean that exposed to weather when completed.

(j) Drawings shall mean the latest issue of the drawings issued to the Contractor.

(k) Instructions by the Architect/Engineer shall include the instructions confirmed in writing within a week by the Contractor.

1.03 Responsibility

No approval or acceptance by the Engineer or their representative shall in any way relieve the Contractor of his responsibility for the construction in accordance with drawings, the quality of materials, the standard of workmanship, the strength, durability and appearance of the concrete works.

The Contractor's rates or price for all measured items shall include for carrying out the works in accordance with the terms and requirements of this specification. In the case of any items not covered by this specification the acceptable quality of materials and standard of workmanship shall be no less than generally accepted in the trade applicable to the item concerned.

2.00 Concrete

2.01 Code of Practice for Concrete Work

All workmanship, materials, tests and performance in connection with the concrete work shall be in conformity with the British Standard Code of Practice BS 8110 for the Design, Materials and Workmanship for "The Structural Use of Concrete" and BS 8007 : 1987 "Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids" where not inconsistent with these Preambles.

2.02 Cement

Cement unless otherwise specified shall be Portland Cement of strength class 42.5 N complying with the requirements of BS 12 : 1991 and a manufacturer's certificate of Test in accordance with BS 12 : 1991 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. Such bag/bags shall be removed from site within 24 hours. Bags shall not be stacked more than 1.5 m in height.

If delivered in bulk the cement shall be stored in waterproof silo either provided by the cement supplier or by the Contractor but in either case the silo shall be to the approval of the Engineer.

2.03 Aggregates

Aggregates shall conform with the requirements of BS 882 : 1992 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 BS 882 and as later specified and the grading, once approved, shall be adhered to throughout the works and not varied without the express prior approval of the Engineer.

Fine aggregate shall be clean, washed, crushed rock sand and coral sand; coral sand where not available can be replaced by similar or of approved size (sugar size) rock sand, of hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. The maximum quantities of material passing the 75 µm sieve shall not exceed the values given in Table 6 of BS 882 : 1992. Coral sand shall be washed in running water to the satisfaction of the Engineer. It shall be graded within the limits of Zone C or M of Table 4 of BS 882.

Coarse aggregate for concrete 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 3 of BS 882 for graded aggregate. The flakiness index shall not exceed 40.

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 aggregate shall be allowed to drain until it has reached a uniform moisture content before it is used.

Moisture/water content in fine and coarse aggregates will be measured daily and the amount of free water is taken into account before adding water to arrive at the w/c ratio of the approved design mix of the concrete.

2.04 Quality of Mixing Water

Water of chemical composition acceptable for drinking is suitable for concrete.

The water used for making and curing concrete and mortar shall be free from objectionable quantities of silt, organic matter, alkali, salt or other impurities. In particular, inorganic matter in solution shall not exceed 500 parts per million by weight and in suspension shall not exceed 30 parts per million by weight and the total alkali bicarbonate/carbonate content of the water shall be less than 1000 parts per million by weight.

The water shall be from an approved source and shall contain no deleterious matter which significantly affects the setting time or strength or durability of the concrete or which has any effect on the appearance of the hardened concrete by discoloration or efflorescence or prevents the achievement of the approved test cube strengths at 28 days for the appropriate grade of concrete.

The Contractor shall test the water which he proposes to use and shall submit the records of such tests to the Engineer before placing any concrete in the permanent works.

The Contractor shall make regular tests of the water during concrete construction works. The water shall be sampled at the point of discharge into the mix and the frequency of sampling shall be as approved by the Engineer.

2.05 (a) Admixtures

Concrete admixtures complying with BS 5075 or ASTM C494 shall be allowed with the prior approval of the Engineer. "Plasticiser" where used will be added to the mixing water in 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.

2.05 (b) Floor Hardeners

Where floor hardener is specified for concrete floor, it shall be 'Sika' Chapdur Premix or approved equivalent and shall be used as per manufacturer's instruction.

2.06 Reinforcement Materials

Steel reinforcement shall be plain mild steel bars or high yield deformed bars complying with MS 10 (2002), or cold worked deformed bars complying with MS 10. Steel reinforcement shall be cut from straight bars free from kinks and bends or other damage and cold bent by experienced competent workmen. At the time of incorporation in the works the reinforcement shall be clean and free from loose mill scale and loose rust.

Bars of diameter 20 mm or greater shall be bent in a bending machine designed for the purpose and approved by the Engineer. Bending and cutting shall be in accordance with BS 4466 unless otherwise specified or ordered by the Engineer.

The Contractor shall supply the Engineer with the certificates of the manufacturer issued in compliance with MS 10 for all the required tests, including the rebend test, in respect of each consignment delivered to site.

Steel fabric reinforcement shall comply with MS 34 & MS 35.

Steel reinforcement shall be stored sheltered and supported by wooden blocks so as to prevent sagging. Bars shall be stored in separate lots according to diameter and quality. No claim on account of non availability of bars up to 12 metre lengths will be allowed.

2.07 Fixing Reinforcement

Reinforcement shall be accurately bent to the shapes and dimensions shown on the drawing and in accordance with BS 4466. Reinforcement must be cut and bent cold and no welded joints will be permitted unless so detailed and approved by the Engineer.

Reinforcement shall be accurately placed in position as shown on the drawings and shall be secured against displacement by using No 18 S.W.G annealed binding wire or suitable clips at intersections and laps, and shall be supported by approved concrete, plastic 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, metal supports, chairs, etc. shall have minimum 12 mm cover made of concrete blocks, or shall have approved plastic shoes.

2.08 Position 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. The minimum period between two inspections shall be 24 hours.

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as above, it shall be Contractor's sole responsibility to ensure that the reinforcement complies with the details on the drawings and is fixed exactly in positions shown therein and in the position to give the prescribed cover.

The Contractor will be held entirely responsible for any failing or defect including crack in any portion of the reinforced concrete structure and including any consequent delay, claims, third party claims, etc., where it is shown that the reinforcement, has been incorrectly positioned or it is incorrect in size or quantity with respect to the detailed drawings.

Unless otherwise permitted by the Engineer, reinforcement shall not be bent after being embedded in hardened concrete.

Unless otherwise instructed concrete cover to reinforcement bars in any face shall be as per Table 2.0.8.

Table 2.08

	A For all members of structures located more than 300 m away from the sea and at altitude less than 350 m, above Mean Sea Level and for internal members fully covered to weather for structures located in B (mm)	B For external members exposed to weather for structures located in proximity of sea within 300 m from sea and for structures at altitude greater than 350 m. (mm)
Substructure		
(a) Foundations against earth face	75	75
(b) Foundations against blinding	50	50
(c) Columns & walls below ground or against water face	40	40
(d) Ground beams	30	35
(e) Slab on hardcore	30	35
Superstructure		
(f) Columns :		
> 200 mm	35	35
200 mm or less	25	30
(g) Beams and walls	30	35
(h) Suspended slabs	20	25

The above cover shall be decreased by 5 mm for concrete surfaces to be finished with cement mortar rendering/screed.

For underground work likely to be affected by sea water, the above cover shall be increased by 25 mm.

For post-tensioned slabs, the minimum cover to polyethylene sheaths of unbonded tendons or to metal ducts for bonded tendons should not be less than 25 mm.

2.09 Concrete Mixes

(1) *Grades of Concrete*

The grades of structural concrete to be used in the permanent works shall be those shown designated in Tables 2.09 (A) and 2.09 B in which the class designation includes two figures. The first figure is the nominal strength at 28 days expressed as N/mm^2 and the second figure is the maximum nominal size of aggregate in the mix.

(2) *Design of Proposed Mixes*

The Contractor shall design all the concrete mixes called for on the drawings, and bills of quantities making use of the ingredients which have been approved by the Engineer for use in the permanent works and in compliance with this Specification.

(i) The aggregate portion shall be well graded from the nominal maximum size to small sizes downwards.

(ii) The cement content shall be such as to achieve the strengths called for in Table 2.09 (A) but in any case not less than the minimum necessary for impermeability and durability shown in Table 2.09 (B).

(iii) The workability shall be consistent with ease of placing and proper compaction having regard to the presence of reinforcement and other obstructions.

(iv) The water-cement ratio shall be the minimum consistent with adequate workability but in any case not greater than that allowable for impermeability and durability shown in Table 2.09 (B) taking due account of any water contained in the aggregates.

(v) The drying shrinkage determined in accordance with BS 1881 shall not be greater than 0.05%.

(vi) The ratio of fine aggregates to total aggregates based on mass shall be within the following limits given in Table 2.09 given below

Table 2.09

Maximum Nominal Size of Aggregate in the Mix (refer 2.09 (i) above)	*Minimum Ratio*	*Maximum Ratio Normal Concrete*	*Max Ratio for Pumped Concrete*
10 mm	0.45	0.55	0.55
14 mm	0.40	0.50	0.50
20 mm	0.35	0.45	0.47
40 mm	0.30	0.40	0.43

Table 2.09 (A)

CONCRETE GRADES AND STRENGTHS

GRADE OF CONCRETE	CHARACTERISTIC COMPRESSIVE STRENGTH AT 28 DAYS (N/mm²)	COMPRESSIVE STRENGTH COMPLIANCE REQUIREMENTS			
		Any individual test result (N/mm²)	Mean of a group of test results		
			First 2 (N/mm²)	First 3 (N/mm²)	Any Consecutive 4 (N/mm²)
15/20	15	13	15	16	17
20/20	20	17	21	22	23
25/20	25	22	26	27	28
30/20	30	27	31	32	33
35/20	35	32	36	37	38
40/20	40	37	41	42	43
45/20	45	42	46	47	48
50/20	50	47	51	52	53

Note : The strength requirements given above shall apply irrespective of the maximum size of aggregates used.

Table 2.09 (B)

MINIMUM CEMENT CONTENT AND MAXIMUM WATER/CEMENT RATIO

GRADE OF CONCRETE	MINIMUM CEMENT CONTENT (kg/m^3)	MAXIMUM WATER/CEMENT RATIO	
		A	B
15/20	200	0.70	X
20/20	250	0.65	X
25/20	300	0.60	X
30/20	325	0.60	0.55
35/20	350	0.58	0.53
40/20	400	0.55	0.48
45/20	425	0.50	0.45
50/20	450	0.47	0.45

Notes :

(a) The minimum cement contents given above are per cubic metre of compacted concrete made with 20 mm nominal maximum size of aggregates. For maximum aggregate size of 12 mm, the minimum cement content should be increased by 40 kg/m^3.

For maximum aggregate size of 40 mm, the minimum cement content may be reduced by 30 kg/m^3.

b) Under the heading "Maximum water/cement ratio", column A applies to sheltered and average conditions and column B applies to severe conditions and water retaining structures. Also the columns A and B apply respectively to members mentioned in Columns A and B of Table 2.08 of Article 2.08.

(c) Use of "An Approved Concrete Admixture" to BS 5075 or ASTM C494 to achieve the strength with the maximum water/cement ratio as tabulated above is allowed.

(d) Use of more than 40 kg over and above the minimum cement content specified and tabulated above is not allowed.

2.10 Requirements for Designed Mixes

(1) *Evidence of Suitability of Proposed Mix Proportions*

Evidence should be submitted to the Engineer to obtain his written approval for each grade of concrete showing that at the intended workability, the proposed mix proportions and manufacturing method will produce concrete of the required quality.

The following information should be provided before any designed mix proposals are submitted for Engineer's approval.

(a) Nature and source of each material including grading requirements of Aggregates mentioned in Article 2.03

(b) Quantity of each constituent in kg per cubic metre of fully compacted concrete. These constituents shall be measured by weight and not by volume.

(c) Either

(i) data from previous production of concrete using the materials and plant which will be used to produce the concrete, confirming that the proposed mix proportions satisfy the criteria given in 2.10 (2); or

(ii) where no satisfactory data exist under item C (i), data from trial mixes confirming that the proposed mix proportions satisfy the requirements of 2.10 (3).

Sampling and testing shall be carried out by the methods described in the relevant Parts of BS 1881.

Subsequently the Contractor should declare any change in sources of materials where Aggregates not complying to Article 2.03 and any change in cement content which results in addition greater than 20 kg/m³ from the cement content last declared:

(2) *Proposals based on previous production data*

When based on previous production data, the mean 28 days compressive strength calculated from n cube results, from separate batches of concrete shall exceed the specified characteristic strength by:

$$k\,s\,[\,0.86 + \sqrt{(2/n)}\,]$$

where

k is a statistical constant, not less than 1.64;

s is the standard deviation estimated from n results, but not less than 3.0 N/mm²;

n is the number of consecutive test results, not less than 10 and not greater than 100. A test result may be a single result or the mean of two or four results from cubes of the same sample provided the difference between the strengths of two cubes divided by their mean is less than 30%.

When n exceeds 100, the mean strength shall exceed the specified characteristic strength by ks, in which k shall not be less than 1.64 and s shall not be less than 3.0 N/mm^2.

Previous production data for use in calculating these criteria shall be 28 day compressive strength results from separate batches of concrete sampled at random over an immediately prior period exceeding 1 month and not exceeding 1 year, using the materials and plant which are proposed for the work.

(3) *Proposals based on Trial Mixes*

Where trial mixes are required three separate batches of concrete should be made using materials likely to be typical of the proposed supply and preferably under full scale production conditions. If circumstances make this inconvenient, with a written permission of the Engineer the batches may be mixed in a laboratory. The workability of each of the trial batches shall be the same as the proposed supply. Three cubes shall be made from each batch for test at 28 days. The average compressive strength of the three cubes tested at 28 days shall exceed the specified characteristic strength by at least 10 N/mm^2.

(4) *Additional Trial Mixes*

During production before any change is made to an approved design mix, the Contractor shall seek an approval from the Engineer giving reasons for the change and substantiating the proposal. This approval may only be obtained if the proposal is submitted with test results of the proposed design mix.

2.11 Requirements of Nominal Volumetric Mix

If the Contractor fails to achieve the requirements of Article 2.10 and/or prefers nominal volumetric mix as per Table 2.11 given below he may use them with a written approval from the Engineer.

TABLE 2.11

NOMINAL VOLUMETRIC MIX

Description	Mix 30/20 1 : 1.8 : 2.8		Mix 25/20 1 : 2.4 : 3.8		Mix 20/20 1 : 2.7 : 4.2		Mix15/20 1 : 4 : 6	
Cement	1 bag of 50 kg		1 bag of 50 kg		1 bag of 50 kg		1 bag of 50 kg	
Crushed rock sand	1¼ cu ft	.0355 m^3	1¾ cu ft	.0497 m^3	$1^7/_8$ cu ft	.0532 m^3	2½ cu ft	.071 m^3
Coral sand/*Sugar size rock sand*	1 cu ft	.0284m^3	1¼ cu ft	.0355 m^3	1½ cu ft	.0426 m^3	2½ cu ft	.071 m^3
10mm to 5mm graded aggregate	1 cu ft	.0284 m^3	1¼ cu ft	.0355 m^3	1¼ cu ft	.0355 m^3	2½ cu ft	.071 m^3
20mm to 10mm graded aggregate	2½ cu ft	.0710 m^3	3½ cu ft	.1094 m^3	4 cu ft	.1136 m^3	5 cu ft	.1419 m^3
Maximum water/ Cement ratio	0.55	0.55	0.60	0.60	0.65	0.65	0.70	0.70
Maximum slump	2"	50 mm	2"	50 mm	2"	50 mm	2 3/8"	60 mm

Note: 1 bag of cement i.e. 50 kg = 1 ¼ cu.ft = 0.0355 m^3

2.12 Ready Mixed Concrete

Ready mixed concrete may be used subject to the approval of the Engineer.

When it is used the Contractor shall ensure that all the requirements of these specifications are complied with.

Further to above requirements, the Contractor shall ensure that transport and delivery of ready mixed concrete comply with the recommendations of Clause 4.10.4 of BS 5328 : Part 3 : 1990.

The concrete shall be transported to the site in truck mixers from the mixing plant premises and shall be continuously agitated until it is delivered on site. The Contractor shall ensure that no further water is added after water added in preparation at the mixing plant.

For plant mixed concrete the Contractor shall check that the delivery note for each truck shows:

(1) volume of concrete in m^3

(2) cement in kg per m^3 of mixed concrete;

(3) grade of the concrete;

(4) initial setting time with or without retarder;

(5) type and quantity of admixture added per m^3 of mixed concrete;

(6) the time when water is first added to the concrete materials; and

(7) the maximum allowable time interval between the completion of discharge and the mixing of water at the mixing plant.

This time interval should be 30 minutes less than the initial setting time of the cement. Any concrete which is not placed in its final position within this time interval should not be used.

The concrete delivery note showing all the above information should be signed by approved qualified/experienced technical supervisors, one at the plant before departure of truck and another one on site before the truck is discharged.

Sample of workscube shall be taken by the Main Contractor at the place where concrete is finally placed in the structural members at the rate specified in Article 2.14.

2.13 Waterproof Concrete

Where "waterproof concrete" is specified, "sealocrete", "Hydro fuge sika", liquid or other approved waterproofing material and plasticising agent complying to concrete admixtures to British Standard 5075 and ASTM C494 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 as specified but not lower than 30/20 and shall meet all the strength requirements of the specified grade, except that the fine aggregate shall consist solely of rock sand.

2.14 Quality Control of Concrete Production

(1) *Sampling*

For each grade of concrete in production at each plant for use in the permanent works, samples of concrete shall be taken at the point of deposition in the presence of a representative of the Engineer, all in accordance with the sampling procedures described in BS 1881 and with further requirements set out below.

Six 150 mm cubes shall be made from each sample and shall be cured, and tested all in accordance with BS 1881 two at 7 days and two others at 28 days. Remainder two to be kept until instructed by the Engineer to be tested/or to be deposed.

Each sample shall be taken from one batch selected at random and at intervals such that the rate of sampling is not less than the minimum rates of sampling given in Table 2.14. At least one sample should be taken of each grade of concrete on each day that concrete is placed. The actual rate of sampling shall be increased for critical elements if instructed by the Engineer.

Table 2.14 (I)

Minimum Rate of Sampling	
Average Rate Of Sampling One Sample Per Batch of	Example Where Applicable
10 m³ or a full truck mixer which ever is less	Columns, Cantilever member piles
20 m³ or anyone of the two full truck mixers, whichever is less	Beams, slabs
40 m³ or anyone of the four full truck mixers whichever is less	Solid rafts, breakwaters

(2) *Testing*

(a) The consistency of all concrete shall be determined by means of the slump test in accordance with British Standard Specification No. 1881 "Methods of Testing Concrete". The Contractor shall provide the necessary number of slump cones and rods as required by the Engineer. The slump cones shall be designed to lift off in a truly vertical plane, this being controlled by guides set on a steel base, the guides being also used to determine the exact amount of slump.

Slump tests shall be made at frequent intervals at the point of deposition when concreting is in progress and as ordered by the Engineer. It shall, nonetheless be taken two nos. for each batch from which samples are taken for cube tests. The first consistency tests shall be made immediately concreting is commenced on any section. For the purposes of any test two slump tests shall be taken at a time and the average adopted for compliance to this specifications.

The slump required shall be determined by the Engineer and shall be varied to suit the purpose for which the concrete is required. The slump of the concrete in any batch shall, however, not differ from the value established by trial mixes by more than 25 mm or one third of the value, whichever is the greater. No concrete shall be used with a slump exceeding 75 mm without the approval of the Engineer.

The cost of providing slump apparatus and labour and materials required for taking slump tests shall be included in the rates for concrete in the Bill of Quantities.

(b) The water cement ratio as estimated from the results of (a) above, or when required by the Engineer, determined by samples from any batch shall not vary by more than 5% from the specified maximum value or the value established during the trial mixes, whichever is the lower.

(c) The compressive strength of the concrete at 28 days shall be such that any individual test result as well as the means of the first 2, first 3 or any consecutive 4 test results comply with the strength requirements given under the appropriate headings in Table 2.09 (A). In this context, a result is defined as the average strength of the two cubes taken from one batch and tested at 28 days.

(d) When the difference between the strengths of the two cubes divided by their mean exceeds 30%, the test result shall be deemed invalid and Article 2.15 (2) shall apply.

2.15 Failure to comply with requirements

(1) *Quantity of Concrete Represented by Strength Test Results*

The quantity of concrete represented by a group of four consecutive test results shall include the batches from which the first and last samples were taken together with all intervening batches. Similarly, the first two or three results shall be taken as representing all the intervening batches. For the individual test result requirements given in Table 2.09 (A), only the particular batch from which the sample was taken shall be at risk.

(2) The Contractor shall take any action instructed by the Engineer to remedy concrete which does not comply with the specification. The results of such actions do not nullify the previous establishment of non-compliance with the specification based on requirements for cube test results. The Contractor shall be responsible for all costs and delays for such actions. Such action may include but is not necessarily confined to the following:

(i) Increasing the frequency of sampling until control is again established.
(ii) Cutting test cores from the concrete and testing in accordance with BS 1881.
(iii) Carrying out strengthening or other remedial work to the concrete where possible or appropriate.
(iv) Carrying out non-destructive testing such as load tests on beams
(v) Removing the failed concrete.

2.16 Mixing Concrete

Before any plant for batching, mixing, transporting, placing, compacting and finishing concrete is ordered or delivered to site, the Contractor shall submit to the Engineer for approval full details of all the plant which he proposes to use and the arrangements he proposes to make, including qualified/ experienced technical personnel separately for supervision of these activities.

Concrete for the permanent works shall be batched and mixed in one or more central plants unless the Engineer agrees to some other arrangement.

Mixer shall be of a capacity sufficient to take two whole bags of cement per mix. Smaller size mixer shall not be used. Weigh batching machines with water measuring device shall be of an approved type and shall be properly maintained and checked weekly for its 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 color.

The entire contents of the mixer 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.

2.17 Conveying

(1) The concrete shall be mixed as near to the place where it is required as is practicable to avoid rehandling and only as much as is required for a specified section of the work at one time, such section being commenced and finished in one operation without delay. All concrete must be efficiently handled and used in the works within thirty (30) minutes before the initial setting time of cement. 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 impair the quality of the concrete. Approved mechanical means of handling will be encouraged, but the use of chutes for placing concrete is permitted provided they are not longer than 6 m and their slope do not exceed 1 vertical to 2 horizontal and is not less than 1 vertical to 3 horizontal. Conveying of concreting by hand-buckets or similar shall not be allowed. Similarly conveying of concrete by belt conveyor shall not be allowed.

(2) Pumped Concrete – Coarse aggregate size shall be limited to 20 mm for pumped concrete mixes. The slump of concrete discharged into the pump may exceed the specified slump by the amount of slump loss in the pumping system up to a maximum of 25 mm. The slump loss shall be the difference between slump tests made at both ends of the pumping system. If tests indicate a loss greater than 25 mm, the Contractor shall modify the pumping system as required to reduce the slump loss to 25 mm or less.

A superplasticiser should preferably be used in pumped concrete. The slump of the concrete mix shall not exceed 75 mm before addition of superplasticiser.

2.18 Depositing

Placing of concrete in supported elements, e.g. slab, beam shall not be started until the concrete previously placed in top parts not exceeding 300 mm depth below the bottom of the beam/slab of columns is no longer plastic and has been in place at least for two hours.

Concrete shall be placed from height not exceeding 1.5 m 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 150 mm thickness from a height up to 3 m and in layers not exceeding 750 mm if ACROW or other 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 has 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 to a height of 3 m with careful placing and vibration to achieve satisfactory results. Where the height of the column exceeds 3 m suitable openings to engineer's approval must be left in the shutters so 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 in article 2.25 or of a part of approved extent. At the completion of a specified or approved part construction joint of the form and in the positions hereinafter specified shall be made. For approval of construction joints and records thereof article 2.25 refers.

2.19 Placing Concrete Under Water

Concrete shall be deposited under water by an approved method e.g. tremie concreting 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.

2.20 Precautions of Mixing and Placing

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing and the area is cleaned thoroughly before further concrete is placed. The Contractor shall provide runways well supported on metal stands for concreting to the satisfaction of the Engineer. Under no circumstances will runways supports be allowed to rest on the reinforcement. Overnight before concreting the formwork and reinforcement shall be thoroughly wetted with clean water and it is again lightly wetted just before concrete is deposited.

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 of the base shall be suitably and sufficiently wetted before the concrete is deposited.

2.21 Compaction of Concrete

(1) *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.

Concrete shall be placed neither at a rate greater than will permit satisfactory compaction nor to a depth greater than 750 mm before it is compacted.

2.22 Vibration of Concrete

(1) *General*

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 with 28 days strength greater than 15 N/mm^2.

Care shall be taken to fill every part of the forms, to work the concrete under and around 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 is removed.

(2) *Internal Vibrators*

Internal vibrators shall have a frequency of not less than 7,000 cycles per minute. Such vibrators shall visibly affect the concrete within a radius of 225 mm from the vibrator.

Vibrator 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 one spare vibrator shall be maintained on site in case of break-down during concreting operations.

(3) *External Vibrators*

External formwork vibrators shall be of the high frequency low amplitude type applied with the principal direction of vibration in the horizontal place. They shall be attached directly to the forms at no more than 1.2 m centers.

In addition to internal and external vibration the upper surface of suspended floor slabs shall be levelled with manual tamping or vibrating elements prior to finishing. Vibrating elements shall be of the low frequency high amplitude type operating at a speed of not less than 3,000 r.p.m.

2.23 Curing and Protection

Care must be taken that no concrete becomes prematurely dry and fresh concrete must be carefully protected within two hours of placing from rain, sun and wind by means of hessian sacking, polythene sheeting or other approved means. This protective layer and the concrete itself must be kept continuously wet for at least three days for members less than 300 mm thickness and 6 days for members greater than 300 mm thickness after the concrete has been placed. The Contractor must allow for the complete covering of all fresh concrete for a period of three days.

Hessian 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 pieces. When temperature exceeds 30° C the new concrete shall be covered with a layer of drip dry hessian.

Traffic or loading shall not be allowed on the concrete except with the written permission of the Engineer.

Contractor should allow in his price the adequate supply and storage of water, if not available from the water main, for curing of the concrete as specified above.

If the Contractor intends to use curing compound or membrane, he should submit full details of the same with manufacturer's literature and test certificate from independent testing laboratory and seek the Engineer's approval before use. The curing compound should have an efficiency index of not less than 90% when tested in accordance with BS 7542. SIKA Top 71 or approved equivalent, without diluting, curing compound shall be applied strictly in accordance with the manufacturer's recommendations. The floor slab shall not be cured by curing compound but by ponding of water for at least three days or 6 days as specified above.

The method of monitoring the application rate and the area to which curing compound has been applied shall be submitted by the Contractor for Engineer's approval and the approved method shall be strictly followed by the Contractor. The Engineer shall, at his discretion, require the Contractor without claiming extra cost to adopt an effective alternative means of curing any area of the structure where curing compound or membrane curing is unsatisfactory in the opinion of the Engineer.

2.24 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 by the Engineer after it has set, the concrete shall be cut out and replaced in accordance with the Engineer's instructions. On no account shall any faulty, honeycombed, or cracked or otherwise defective concrete be repaired or patched 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.

2.25 Construction Joints

(1) *Position of Construction Joints*

Construction joints shall be permitted only at the locations shown on the drawings or as instructed/agreed on the site by the Engineer. In general they shall be perpendicular to the lines of principal stress and shall be located at points of minimum shear, viz. vertically at, or near, mid-spans of slabs ribs and beams.

Where construction joints are not shown on the drawings, the Contractor shall submit the plan of floor layout, column and wall elevations showing the construction joints to comply with all requirements of this Article and seek the Engineer's written approval immediately on or before fixing reinforcement. The Contractor shall keep record of position and details of all construction joints and submit to the Engineer within a week of completion the drawing showing them.

(2) *Maximum Distance between Construction Joint*

Suspended slabs are generally to be cast using alternative bays not exceeding 12 m in length. At least 48 hours shall elapse between the casting of adjacent bays. Joints between bays shall be in positions to be agreed with Engineer. Beams shall be cast with the slab.

Mass concrete shall be cast in alternate bays in lengths not exceeding 7.5 m and in depths not exceeding 1.5 m. Adjacent sections shall not be cast within 48 hours of each other. Ground floor slab on hardcore shall be cast in alternate bays not exceeding 4.0 m in length and/or width, unless otherwise shown on the drawings. At least 48 hours shall elapse between the casting of adjacent bays.

Under no circumstances shall concrete be allowed to tail off, but shall be deposited against stopping-boards.

(3) *Preparation of Construction Joints*

Before placing new concrete against concrete already set, the face of the old concrete shall be thoroughly hacked and roughened to expose the coarse aggregates without damaging/breaking the edges of the concrete. Edges of concrete if damaged shall be repaired with 'Epoxy Mortar" of approved quality. The surface shall be cleaned, laitance and loose material removed therefrom. Immediately before placing the new concrete the surface shall be saturated with water. All construction joints of roof, external walls and columns; and external beams shall be treated with epoxy resin in accordance with the manufacturer's instruction by an experienced skilled worker. Main Contractor shall ensure that full watertightness of external construction joints is achieved.

Before the final set of the concrete, the construction joint at its top shall be made good with surface trowelling.

(4) *Reinforcement across Construction Joints*

At construction joints in slabs, minimum reinforcement of 0.15% of the cross section of the slab should be provided on each face of the slab unless otherwise as detailed shown by the Engineer.

Prices for concrete shall include for construction joints as required by Articles 2.25 (1) to 2.25 (4) above.

2.26 Expansion/Contraction Joint

Joint fillers shall be flexcell except where high density styropor is shown on the drawing. Sealants shall be Elastomeric of an approved type unless otherwise shown on the drawings. Reinforcement or other embedded items bonded to the concrete shall not extend through any expansion/contraction joint.

External peripheral strip of the joint fillers shall be sawn and fixed so that it can be removed easily to form correct and true depth and width of the sealants. Unless otherwise shown on the drawing the depth of the sealants shall be equal to the width of the expansion joint.

The gap for sealants shall be cleared of any mortar and foreign material. The edges of concrete on the sides of the expansion joint shall be protected from breaking. Broken edges shall be repaired with "Epoxy Mortar" of approved quality such that the width and the line of the expansion joint is perfectly maintained.

The elastomeric sealants shall be applied after the application of approved separating membrane and the primer all as per manufacturer's specifications.

2.27 Waterbars

(1) *Type*

Waterbars shall be PVC waterbars to British Standard 2782 Part 3 and of an approved type, shape and size (min 240 mm wide where not shown) shall be provided in the positions indicated on the drawings. At places galvanised m.s strip of minimum thickness of 1.0 mm in corrugated shape and of 300 mm minimum width in the following properties i.e. can be used as waterbar, pvc waterbars where shown as such, i.e.

(i) Tensile strength min 12.5 N/mm^2

(ii) Elongation at break 300%

(iii) Hardness

and resistant to aggressive water, diluted acids, moderate alkalis and salt etc.

(2) *Joints*

Joints shall be continuously heat welded in accordance with the manufacturer's instructions. Where the waterbar is to be fixed vertically, metal clips as manufactured by the supplier of the water bar or of other approved design shall be provided to suspend the waterbar from the reinforcement.

(3) *Additional Waterbar*

The Contractor shall adhere strictly to the position and type of construction joints as specified or 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.

(4) *Formwork to Waterbar*

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 vertical walling and similar members the formwork shall be so constructed as to permit the kicker 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 waterbar is positioned at the base of the lift shall have sufficient openings not less than 300 mm square at approximately 225 mm above the level of the waterbar to permit checking that the waterbar is correctly positioned and not displaced during concreting.

No concreting to a member will be approved where kicker or upstand forms its integral part, until the formwork to the upstand is fixed and the waterbar position is secured.

2.28 Embedded Items in Concrete

(1) *General*

All sleeves, inserts, anchors and embedded items required for adjoining structural 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 sub-contractors whose work for various services is related to the concrete and/or must be supported by it shall be given ample notice and opportunity to furnish and/or fix embedded items. Main Contractor shall obtain a written approval of service consultants before formwork and reinforcement to engineer's design/drawings is inspected by the Engineer. Approval of concreting by the Engineer does not relieve the Main Contractor of his responsibility to correct sizes and position of the embedded items in the concrete for services etc.

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 materials to prevent concrete entering into them.

(2) *Electrical Conduits*

Conduits shall be of size not exceeding 20 mm overall diameter. They shall be placed at least 75 mm apart in the central thickness of the slab and beam. The group (consisting of maximum 3 @ 75 mm each apart) of conduits to be spaced at not less than 2000 mm apart. At crossing the conduits should not be more than 2 nos. vertically. Where diameter of conduits exceeds 20 mm, a written approval of such drawing showing their exact position and numbers should be obtained from the Engineer. The same applies to insert for electrical sockets, similar fittings into the concrete members.

2.29 Formwork

(1) *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.

Shop drawings for formwork including the location of shoring and reshoring shall be submitted for approval by the Engineer before erection. As and when requested by the Engineer, the calculations for the design of formwork will be submitted for approval by the Engineer before erection.

(2) *Construction*

All formwork shall have joints close enough to prevent leakage of liquid from the concrete and formwork shall be jacked or wedged and clamped or bolted to permit adjustments before concreting and to permit easing and removal 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 by the Contractor to the amount approved by the Engineer to compensate for anticipated deflections prior to hardening of the concrete. Unless where shown/directed otherwise the amount of camber to be 1/500 of the span; e.g. for 10 m span camber to be provided is 20 mm.

(3) *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 joints contact surface of the form for surfaces shall overlap minimum 300 mm and shall be held tight against the hardened concrete to prevent offsets 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 the Engineer's approval.

All surfaces which will be in contact with concrete shall be oiled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type as approved by the Architect/Engineer and shall be applied as a thin film before the reinforcement is placed.

Surplus moisture shall be removed from the forms prior to placing of the concrete. For surfaces to receive waterproofing membrane, an approved water based mould oil compatible with the specified waterproofing materials shall be used. For fair-face concrete to receive paint, an approved mould oil compatible with paint shall be used.

Temporary openings shall be provided at the base of columns, wall and beam 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.

(4) *Defective Formwork*

Defective formwork shall be removed or strengthened and improved by the Contractor according to the instructions by the Engineer at no extra cost to the Employer.

(5) 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 approved by the Engineer before placing reinforcement unless previously agreed with the engineer, then it will be inspected along with the inspection of reinforcement prior to concreting.

2.30 Stripping Formwork

Formwork shall be removed without undue vibration or shock and without damage to the concrete.

Contractor should submit concrete cube test results at 3 days/7 days and seek the Engineer's approval before removal of formwork. 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:

(a)	Beam sides, walls and columns (unloaded)	24 hours
(b)	Slab soffits except of flat slab, shell roof, folded plate construction (with props designed to left under)	84 hours
(c)	Soffits of ribbed slab and hollow block composite floor slab except solid strips (with props designed to left under)	5 days
(d)	Flat slab, shell roof and folded plate construction slab soffits and sides (with props designed to left under)	10 days
(e)	Beam soffits including those of solid strips of hollow block composite floor slabs, waffle slab (with props designed to left under)	10 days

If the formwork is not designed for removal of soffits with props left in place, the soffits and props should be left in position until the appropriate period for removal of props given below. (Subject to works cubes achieving at 7 days strength equal to 2/3 of specified 28 days strengths and the loads due to constructions on them being lighter than the designed superimposed loads,

(f)	Slab soffits except of flat slab, shell roof, folded plate construction	10 days
(h)	Flat slab, shell roof folded plate construction slab soffits and sides	14 days
(i)	Beam soffits including those of solid strips of hollow block composite floor slabs, waffle slab	14 days

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.

For system of construction of r.c walls by slip forms or similar; the full details of the system of formwork, its rate of travel, method of making good and curing of concrete, method with detailed drawings for reinforcement starters for structural r.c members to be supported on the r.c walls and other relevant details to be submitted for the approval by the engineer before commencement of works.

For systems of construction such as prestressing or post-tensioning, stripping of formwork should be carried out after the concrete attains the requisite strength and after tensioning of tendons, but in no case shall it be less than 72 hours.

Contractor shall be responsible for consequent damage arising from early stripping of formwork.

2.31 Making Good

After removal of formwork, all projections, fins, 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 Clause 2.24 "Faulty Concrete".

2.32 Surface Finishes from Formwork or Moulds

(1) *Type A finish*

This finish is obtained by the use of properly designed formwork or moulds of closely-jointed sawn boards. The surfaces will be imprinted with the grain of the sawn boards and their joints. Alternatively, steel or other suitable material may be used for the forms. Small blemishes caused by entrapped air or water may be expected, but the surface should be free from voids, honeycombing, or other large blemishes. Permissible tolerances are to be as per Clause 2.34 (1) to (7) of this specification.

Unless and otherwise shown, this is the finish required for all rendered surfaces after hacking as specified for rendering to architect's specifications.

(2) *Type B finish*

The finish is obtained by the use of properly designed forms of closely-jointed wrought boards. The surfaces will be imprinted with the slight grain of the wrought boards and their joints. Alternatively, steel or other suitable material may be used for the forms. Small blemishes caused by entrapped air or water may be expected, but the surface should be free from voids, honeycombing, or other large blemishes. Permissible tolerances are to be same as (1) above. Unless and otherwise shown, this is the finish required for surfaces covered by false ceiling and by metal framework to fix wall cladding etc.

(3) *Type C finish*

This finish can only be achieved by the use of good quality concrete and by using properly designed forms having a hard, smooth surface. The concrete surfaces should be smooth with true, clean arrisses. Only very minor surface blemishes should occur and there should be no staining or discolouration from the release agent.

Permissible tolerances are to be half of those mentioned in Clause 2.34 of this specification.

Unless and otherwise shown, this is the finish required for "Fairface" concrete or precast concrete.

(4) *Type D finish*

This finish is obtained by first producing a Type B finish on thoroughly compacted high quality concrete, cast in properly designed forms. The surface is then improved by carefully removing all fins and other projections, thoroughly washing down and then filling the most noticeable surface blemishes with a cement and fine aggregate paste. Every effort should be made to match the colour of concrete. Care should be taken, in the choice of any release agent used, to ensure that the finished concrete surface is not permanently stained or discoloured.

Unless and otherwise shown, this is the finish required for "off shutter" concrete where shown without rendering and to remain exposed after painting to architect's specifications.

(5) *Type E finish*

This finish is obtained by first producing a Type C finish and then, while the concrete is still green, filling all surface blemishes with a fresh, specially manufactured and marketed approved cementitius paste/slurry coloured or plain to architect's approval as a base coat and thereafter applying on the same day a finished coat, total thickness to be specified by the architect, finished even and smooth with steel trowel without any marks. Every effort should be made to match the colour of the concrete. Thereafter the unit is properly cured, the faces rubbed down where necessary, to produce a smooth and even surface. This finish is used only where so specified by the architect for special surfaces.

A sample for each of the above surface finishes will be made for at least of 10 m^2 area for approval by the architect and the engineer. The sample will be used for comparison for acceptance of similar specified finished surfaces.

2.33 Grades of Finish on Free Surfaces

Horizontal or nearly horizontal surfaces which are not cast against formwork shall be finished to the grade shown and/or specified by the Architect. They are defined hereunder.

(1) *Grade U1*

This is a hard smooth steel trowelled surface for use where appearance is important, for laying of finished product with minimum thickness of adhesive and for laying epoxy thereon.

To start with, the surface shall be floated as for a U2 finish. When the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, it shall be steel-trowelled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.

The tolerances to be achieved for the finished surface when measured should not be more than a half of what is specified in Clause 2.34 (3) (5) and (6).

(2) *Grade U2*

This is a floated finish for roof or floor slabs and other surfaces where a hard steel trowelled surface is not required e.g. for laying waterproofing membrane, pvc tiled floor on adequate thickness of filler/adhesive all to architect's specifications.

The surface shall first be treated as a Class U3 finish and after the concrete has hardened sufficiently, it shall be floated by hand or power floated sufficient only to produce a uniform surface free from marks and thereafter wood floated.

The tolerances to be achieved for the finished surface when measured should not be more than of what is specified in Clause 3.24 (3), (5), and (6).

(3) *Grade U3*

All surfaces on which no higher class of finish is called for on the drawings or instructed by the Engineer shall be given a U3 finish.

The concrete shall be levelled; all voids filled with concrete, (and screeded where so stated/specified, screed to be monolithic with concrete,) to produce a uniform plain or ridged surface without any voids or projecting coarse aggregates, surplus material being struck off by a straight edge immediately after compaction.

A sample for each of the above grades of finish on Free Surface will be made at least of 10.0 m^2 area for approval by the architect and the engineer. The samples will be used for comparison for acceptance of similar specified finish for the free surface

Where floor hardener is required by the architect for any of the above surfaces, it shall comply to Clause 2.05 (b) of this specification

2.34 Tolerances

(1) On all setting out dimensions of 10.0 m and over a maximum non-cumulative tolerance of plus or minus 10 mm will be allowed, and for those under 10 m the allowable maximum non-cumulative tolerance will be plus or minus 5 mm.

(2) On the cross sectional dimensions of structural members, unless otherwise required by the drawings, a maximum tolerance of plus or minus 5 mm will be permitted.

(3) The top and soffit surface of slabs shall be within 5 mm for area less than 40 m^2 and within 10 mm for area 40 m^2 and above of the normal levels shown on the drawings. The top of upstand beam and soffit of downstand beams shall be truly level and line and non-cumulative tolerance of 5 mm for length up to 10.0 m and not more than 10 mm for full length of the beam exceeding 10.0 m length.

(4) Walls and columns shall be truly plumb and non-cumulative tolerance of 10 mm in each storey and not more than 20 mm out in their full height will be permitted.

(5) Surface tolerance for slab on grade of industrial buildings, warehouses, etc. shall be based on a 3 m long straight edge which rests in contact with the floor surface. The maximum gap under the straight edge should not exceed 5 mm.

(6) Where drawings call for tolerance other than those given in the above paragraphs the drawings shall prevail.

(7) 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 tolerance set out above.

2.35 Precast Concrete

(1) *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 20 mm except for members of thickness less than 75 mm where it shall not exceed 12 mm. Minimum cement/m^3 of concrete will be increased as per guidance given in Table 2.09 (B).

The compacting of precast concrete shall conform with requirements given elsewhere in these preambles except for thin slabs where use of immersion type vibrators is not practicable, the concrete in these slabs may be consolidated on a vibrating table or by any other methods approved by the Engineer.

(2) *Curing*

The precast work shall be made under cover and shall remain under the same for three days. During this period and for a further four days the concrete shall be shielded by hessain sacking or other approved material which including concrete must be kept continuously 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.

Steam curing of precast concrete will be permitted. The procedure for steam curing shall be subject to the approval of the Engineer.

(3) *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.

(4) *Repairs*

Repair of damage to the precast 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.

(5) Moulds

Except where precast work is described as "fair-face" or as having an "exposed aggregate" or terrazo finish the moulds shall be made of suitable strong sawn timber true in form to the shape required. Unless otherwise described faces are to be left rough from the sawn moulds.

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 shutter marks, holes, pitting, 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/ Architect.

Where precast work is to have an "exposed aggregate" or terrazo 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 before commencement of the works.

The precast units shall be installed to the lines, grades and dimensions shown on the drawings or as directed by the Engineer.

2.36 Predalle

General requirements as per Article 2.35 (1) apply. Articles 2.35 (1) to (5) shall apply except where they differ as stated below.

Moulds shall be made of metal or concrete and shall be rigid enough to achieve the required dimensions and thickness. The mould shall be approved by the Engineer before commencing. Mould oil shall be compatible with the specified paint to the soffit of predalle.

The reinforcement in fabric mesh or as detailed shall be placed in exact position. The lifting hooks and/or reinforcement shall be adequately lapped and tied with 18 S.W.G. wires or welded if approved to the reinforcement.

The concrete shall be as specified except that the maximum size of aggregate shall be 14 mm to BS 882 instead of 20 mm. The concrete shall be placed in one operation in moulds laid horizontally and shall be vibrated by means of maximum 25 mm diameter poker type vibration or a vibrating table or an external vibrator. The top surface of the concrete shall be finished rough. Removal of laitance by water at approved pressure in hose pipe shall be allowed 12 hours after concreting.

Any unit found of thickness less than shown or not being cured properly or with reinforcement incorrectly placed in position or cracked/damaged; shall be rejected by the Engineer.

2.37 Composite Floor Slabs

(1) *Size, type & 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 30 mm 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 BS 6073 or MS 42.

No coral sand shall be used in making of concrete blocks. The compressive strength of concrete block on gross area to be not less than 3.5 N/mm² at 28 days.

Concrete blocks are to remain under cover and to be cured as per articles 2.35 (2) precast units and stored for at least 14 days before use on the site.

Concrete blocks are to be well wetted before 12 hours and immediately before concreting.

(2) *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 insitu ribs and solid strips.

Concrete block where shown on the drawings for less than full width e.g. ½ and 1/3 width shall be cut by grinder or manufactured as such. The length of the concrete block where it encroaches the solid strip shall be cut by grinder. Contractor to include cost of the cutting in his prices.

The open ends of hollow blocks adjacent to the concrete to be placed insitu are to be plugged or stopped previously with concrete 25/20 grade 40 mm thick 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. The formwork shall be for whole area covering the blocks and 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 insitu concrete shown on the drawings adjacent to supporting beams is not encroached upon by the blocks.

The purpose made spacer blocks of approved size is made in mortar of not less than a half strength as of specified strength of concrete with grooves and tying wires shall be used to maintain the width of the ribs and positioning of reinforcement. Contractor to include for this in his pricing.

It is required that the concrete for topping is placed along with concrete to the ribs between hollow blocks.

(3) *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 no more than 1.2 m centres. Care must be taken during concreting that the reinforcement is not displaced.

(4) *Holes for services, etc.*

Where holes for services, etc. occur, the necessary holes or openings shall be accommodated by the replacing of a hollow block by insitu concrete or the widening of a rib including extra reinforcement all in accordance with the Engineer's instructions. Prices for holes/opening etc. through hollow block construction are to include the re-arrangement or substitution of the hollow block with solid concrete and reinforcement in addition to the actual formation of the hole.

(5) *Embedded Items in concrete*

Clause 2.28 (1) General and 2.28 (2) electrical conduits of this specification for concrete for embedded items and electrical conduits shall apply except (i) no electrical conduits will be placed in the topping less than 70 mm thick and (ii) where conduits are required to be placed in topping, they shall be placed in size not exceeding 20 mm before placing reinforcement to topping i.e. below the reinforcement on top of the concrete blocks.

2.38 Waffle Slab Construction

(1) *Size, type and materials of waffle moulds*

The size and shape of the mould to be used in the construction is required to achieve the profile as shown on the drawings by the Architect and/or the Engineer.

The moulds are made of glass fibre. The moulds shall have dimensional accuracy and constant profile. The moulds shall not stain the concrete. When it is normally exposed in weather under all conditions and under working loads on site, its shape shall not get deformed.

Repetitive use of placing and removal of the mould if found damaging its profile, shall be replaced by a new one at no extra cost to the Employer.

Sample of concrete of the waffle slab using at least 4 moulds shall be prepared to enable the Architect and/or Engineer to approve the sample of mould used before the same is used for the formwork to slab.

(2) *The floor construction*

Waffle slab construction is generally to be as shown on the Engineer's drawings. Care shall be taken in placing the waffles to ensure that they are set out in accordance with details shown on the drawings and that they run truly in line without encroaching on the width of the in-situ ribs.

Contractor should note that slip tiles shall not be used to soffit of the ribs. Waffle shall be placed on fully decked out formwork for whole area covering the waffles and in between ribs and Contractor should take this into consideration when pricing the items of formwork to the soffit of the slab. Price of formwork to waffle slab shall deem to include for both moulds and decked out formwork.

Appropriate approved wax based mould release agent compatible with the specified part shall be used for releasing waffle moulds. Before concreting is carried out the surface is wetted thoroughly with water.

Care should be taken during concreting that the width, of ribs between moulds of solid in-situ concrete shown on the drawings adjacent to supporting beams and of solid strip is not encroached by the moulds. The purpose made spacer blocks of approved size is made in mortar of not less than half strength as of specified concrete with grooves and 18 swg tying wires shall be used to maintain the width of the ribs and positioning of reinforcement. Contractor to include for this in his pricing. It is required that the concrete for topping is placed along with concrete to the ribs between the moulds.

(3) *Fixing of rib reinforcement*

Reinforcement shall be positioned accurately with required cover in accordance with the drawings, using particular spacing of blocks with wire ties as previously described. Spacer blocks shall be provided in ribs at not more than 1.2 m centres. Care must be taken during concreting that reinforcement is not displaced.

(4) *Holes for Services*

Where holes for services, etc. occur, the necessary holes or openings shall be accommodated replacing a waffle by in-situ concrete or the widening of solid strips including extra reinforcement all in accordance with the Engineer's instructions. Price for forming opening/ hole, etc. through waffle shall be deemed to include the rearrangement and/or substitution of the waffle with solid concrete and reinforcement.

(5) *Embedded Items in Concrete*

Clause 2.28 (1) General and 2.28 (2) electrical conduits of this specification for concrete for embedded items and electrical conduits shall apply except (i) no electrical conduits will be placed in the topping less than 80 mm thick and (ii) where conduits are placed in toping, they shall be placed in size not exceeding 20 mm before placing reinforcement to topping i.e. below the reinforcement with min 10 mm concrete cover under the conduit.

(6) *Finished surfaces*

Bottom and side surfaces of concrete after removal of mould shall be fairface as specified in Article 2.32 Type C Finish. Touching up or cement wash to surfaces shall not be accepted. Surfaces should be plane at shown levels and shape with smooth or uniform texture and appearance free from all surface defects. Construction joints shall be made such that no grout leaks/overflows under soffit/sides of waffle moulds and the concrete ribs/solid strip/beams etc. The joint shall be in a straight line showing solid non honeycombed uniform smooth and perfectly level concrete. Touching up, if any required, shall be carried out after instructions from the Engineer and shall be to the satisfaction of Architect and Engineer.

2.39 Post Tensioning with Bonded Tendons

(1) *Tendons*

Tendons shall be of low relaxation 7 wire strands complying with the requirements of BS 5896 : 1980 (seven wire super strands) or Grade 270 of ASTM 416.

Contractor shall submit test certificates from results of manufacturer's production testing for each batch of material for all tests generally carried out by the mill. Tests on samples selected from site shall be carried out as required by the Engineer.

Tendons should be free from kinks and permanent bends. Tendons shall be clean and free from rust, scale, pitting, corrosion and any lubricant or oil that would affect their bond with the cement grout.

Pre-made tendons shall be identified and labelled with all relevant data.

It should be ensured that all tendons are adequately protected against corrosion throughout construction. Any tendons with signs of corrosion will be rejected.

Tendons remaining unstressed in ducts for more than four weeks shall either be removed or inspected before stressing, or shall be specially protected from corrosion in an approved manner.

(2) *Ducts and vents*

Ducts shall conform to Clause 9.2 of BS 8110.

Ducts shall be mortar-tight and strong enough to resist damage and deformation during construction. Ducting material left in place shall not cause electrolytic action or deteriorate. Ducting should be approved by the Engineer and if it is found unsatisfactory, it should be replaced by the Contractor with a stronger duct.

Joints in ducts should be sealed so that they are waterproof under the normal pressures to which they will be subjected during concreting.

Grout holes or vents should be provided at anchorages and at crests in the profile and at major changes in the section of the duct. Vents should be provided at intervals not greater than 15 m. Vents and injection connections to the duct should be secured and tight. They should be able to withstand disturbance and pressures generated in concreting and grouting.

The vents to be used as entry points for grout should have appropriate type of connector for the grout pump.

For members where the grouting operation is delayed for more than 2 weeks after stressing, including stage stressed members, drainage lines should be provided to the low point(s) of the profile unless other approved means of corrosion protection are being employed.

(3) *Anchorages*

Anchorages shall conform to the requirements of BS 8110 and BS 4447.

All anchorage devices fixed at stressing ends of tendons shall be capable of being fully released if required after the tendon has been anchored.

Contractor shall submit full details of all prestressing anchorages proposed including relevant test certificates. The normal "draw-in" of the tendons when anchoring the tendon in the anchorage device shall be stated.

(4) *Storage and protection of tendons and anchorages*

All tendons and anchorages components shall be stored under cover and protected from corrosion. All threaded components shall be protected by greased wrapping or plugs until used. Anchorage devices shall at all times be kept free from dirt, mortar, rust, paint, or any deleterious matter.

Anchorages cast into the work shall be protected from corrosion during the period prior to receiving the permanent protection.

Any anchorage or anchorage component which has been damaged in any way shall not be used.

(5) *Grout*

Grouting is a vital step in the protection of the highly stressed tendons against long term corrosion. All ducts containing post-tensioned tendons shall be completely filled with grout.

Ducts shall be grouted as soon as possible after stressing the tendons but not later than four weeks. Grout shall comply with the requirements of BS 8110. Conformance should be demonstrated by test prior to commencement on site.

Sampling of grout for compressive strength test shall be at the rate of one sample per 1 cubic metre of grout placed with a minimum of one sample per day of grouting. Each sample shall consist of six cubes of 100 mm sides.

(6) *Fixing ducts and anchorages*

Ducts should be secured in position to ensure no movement during concreting. The profiles should follow smoothly between support points and be free from kinks and sudden bends. Site-made tendons shall be inserted in such a way as to avoid any damage or contamination to either the tendon or the duct. Any clashes with untensioned steel or cast-in obstructions should be reported to the Engineer for resolution.

Anchorages shall be fixed securely in position and square to the line of the tendon or to the tangent to the curve at the end of the tendon. Grout-tight joints should be ensured between the anchorage and the formwork and between the anchorage and the duct surrounding the tendon.

(7) *Tolerances*

Ducts shall be placed so that tendons when stressed shall not deviate from their correct profile at any point by more than 5 mm unless noted otherwise on the drawings, except that the required concrete cover shall not be reduced.

(8) *Tensioning*

Tensioning shall comply with the requirements of BS 8110.

No tendon shall be tensioned until the concrete has attained the required transfer stress. For ensuring this, the concrete test cubes should be cured in the same way as the concrete in the structure and cube test results are to be submitted to the Engineer while seeking approval for stressing.

The stressing operation shall be performed only by personnel trained and experienced in this type of work. Special care shall be taken to apply the tensioning force smoothly and evenly. The stressing operation shall be performed in accordance with the best practice applicable to the particular system adopted. The tendons shall be stressed to the initial forces specified in the drawings.

The sequence of stressing shall be as shown on the drawings. To minimise uneven distribution of forces and to avoid tensile cracking, the stressing sequence used shall ensure that the forces applied are kept as symmetrical as possible about the centroid of the tendons within the structural element.

No member shall be left partly stressed except as specified on the drawings for staged stressings.

The jacks shall be set accurately in the line of the tendons. The force which is applied initially to take up the slack of the tendon shall be sufficient to set the jack firmly but shall not exceed the amount normally associated with the particular method of prestressing.

Allowance should be made during stressing for the friction in the jack and in the anchorage.

In the case of a tendon breaking or slipping, the tendon shall be released, replaced if necessary and re-stressed. Any other corrective/remedial actions as required shall be carried out to the Engineer's approval.

A record sheet shall be made for the stressing operations and the following data shall be recorded:

(i) Identification number of each piece of equipment used (e.g. pressure gauge, pump, and jack, etc.)
(ii) Date and time of stressing
(iii) Identification particulars of tendons
(iv) Initial forces (or pressures) when tendons are marked for measurement of elongation
(v) Final forces/pressures obtained on completion of tensioning
(vi) Theoretical elongations
(vii) Final elongations remaining after release of jacks
(viii) Remarks

The records shall be signed by the Supervisor and submitted for scrutiny and approval by the Engineer before any tendon is grouted.

(9) *Elongation of tendons*

The elongation of tendons shall be measured to the nearest millimetre and the tendon force evaluated by applying the load-elongation curve to it. This should be compared with the tendon force obtained by measuring the jacking force or pressure and deducting the appropriate transfer losses from it. Where discrepancies between the two methods of determining tendon force exceed 10%, the Contractor shall ascertain the cause and submit proof that any proposed remedial works will correct the situation to the satisfaction of the Engineer before proceeding. Similarly, the Contractor shall ascertain the cause and submit details of any remedial works when discrepancies between measurements for strands of the same length and profile exceed 5%.

(10) *Grouting*

Grout shall be batched and mixed and the grouting carried out in accordance with BS 8110. The grout shall be kept agitated during the whole grouting operation, which shall be a continuous process. All equipment, especially piping, shall be thoroughly washed out after each series of operations, or at a maximum of 3 hour intervals. Grout shall not be used later than 30 minutes after the addition of the cement to the mix, unless it incorporates a retarder.

Prior to grouting, ducts shall be cleaned out with oil-free compressed air. The grout shall then be injected into each duct from the lowest grout tube in one continuous operation. A continuous, steady flow of grout shall be maintained until the duct is completely filled and all entrapped air has been expelled. Grouting should continue until the fluidity or density of the grout flowing from the free ends and the vent openings is the same as that of the injected grout. The vents shall be progressively closed as required to ensure the complete filling of the duct. All vents and ends shall be kept closed until final setting of grout has taken place. After closing the last vent, the pressure should be held at 0.5 N/mm² for 5 minutes. Where necessary, duct openings shall be inspected two or three days after grouting.

If serious leaks occur, or the grouting needs to be stopped for any reason, the duct shall be immediately flushed clean with water.

Vents and all other openings should be sealed after grouting to prevent the ingress of water or other corrosive agents.

(11) *Anchorage protection*

On satisfactory completion of stressing and grouting operations, all protruding tendons shall be cut off using an abrasive cutting disc. The tendons should not be cut too close to the anchoring device and a minimum protrusion of 20 mm should be allowed.

The anchorage pockets shall be thoroughly cleaned and the exposed anchorages and tendon ends shall be coated with an approved epoxy and grouted with an approved non-shrink mortar mix. The cover to the ends shall not be less than 30 mm.

The mix must not contain any substances that will affect the tendons. The Contractor shall produce prototypes of such works, including the standard of colour and surface matching achievable, for approval prior to commencement of the works.

(12) *Safety*

Adequate precautions shall be taken during tensioning operations to ensure the safety of all personnel engaged on the work and of other persons in the vicinity of the work. As a minimum, this will require areas behind anchorages to be screened off with safety barriers and clearly displayed warning signs. No person shall be permitted to stand behind the jacks or close to the line of tendons while tensioning is in progress. Jacks shall be secured in such a manner that they will be restrained should they lose their grip on the tendons. The operation of the jacks, the measurement of elongation and associated operations, should be carried out in such a manner and from such positions that the safety of all is ensured.

Personnel engaged on grouting operations and other persons in the vicinity of the work should be made aware of the possible hazards associated with the production of pressurised grout and the use of compressed air. All involved should wear eye protectors at all times.

(13) *General requirements*

(a) *Supervision*

The Contractor shall provide a Supervisor experienced in prestressed construction using the post-tensioning system and equipment being adopted for this work.

(b) *Shop Drawings*

Prior to construction, the Contractor shall prepare prestressing shop drawings necessary for the proper fabrication and placement of the tendons and anchorages. The Contractor will be fully responsible for dimensional accuracy of shop drawings. Two copies of shop drawings shall be submitted for review and acceptance by the Engineer.

(c) *Concreting*

Vibrators shall not come into direct contact with the duct or tendon. If duct or tendon is damaged or displaced during concreting, the whole or a portion of the concrete may be rejected. Particular attention shall be taken to ensure no honeycombing or porosity occurs in the concrete in the vicinity of the anchorages. Temporary openings should be provided in formwork where necessary.

(d) *Formwork*

Formwork shall not restrain shortening or deflections resulting from application of the prestressing force, and shall be designed for any loading effects imposed by the prestressing.

(e) *Scaffolding*

Where necessary, provide working platforms, etc., as a means of access for the stressing and grouting operations. This access shall remain available on site until the final grouting of the anchorage pockets.

(f) *Tendons and Anchorages*

Tendons or anchorages shall not be subjected to excessive temperatures, welding sparks or ground currents. Burning and welding operations should not be carried out in the vicinity of tendons.

(14) *Stressing equipment calibration*

Stressing equipment shall be calibrated to an accuracy of 2%. Current calibration curves for the equipment to be used shall be made available prior to stressing, and be available for inspection on site during the works. All stressing equipment shall be re-calibrated at intervals not exceeding 6 months, except that it shall be recalibrated immediately should it be suspected that the equipment has been damaged or become inaccurate.

2.40 Post Tensioning with unbonded tendons

(1) *Prestressing tendons*

The tendons shall be low relaxation 7 wire stands, coated with special grease and covered by a polyethylene sheath extruded over the strand. The strands shall conform to ASTM -A416 (Grade 270) or to BS 5896 (seven wire super strands).

Contractor shall submit test certificates from manufacturer's production testing and from tests on selected samples to the Engineer.

The coating of grease should be continuous over the entire tendon length and should completely fill the sheathing without air pockets. The grease shall be such as that it neither hardens and cracks nor become fluid over the normal range of temperatures during fabrication, transportation, storage, installation, tensioning and while in service. It should not contain any harmful compounds such as chlorides, sulphides or nitrates except in traces harmless to tendon materials.

The sheathing should be of either high-density polyethylene or polypropylene. The material should be of a type which will not react with cement, grease coating or steel. It should be durable and resistant to damage and abrasion with reasonable handling and should remain stable and flexible during handling, storing, installation and service. It should be resistant to ageing by exposure to ultraviolet light.

The sheathing should be able to bridge any fine cracks that may occur in the concrete. The thickness of the sheathing should not be less than 1.0 mm.

(2) *Anchorages*

The requirements of Article 2.39 (3) shall be applicable.

(3) *Storage and protection of tendons and anchorages*

The requirements of Article 2.39 (4) shall be applicable. In addition, adequate precautions should be taken during handling and storage in order to avoid damage to sheathing of tendons. Any localised damages to sheaths should be promptly remedied. If sheaths are damaged over a considerable length, such parts of the tendon shall not be used on the work.

(4) *Installation*

Tendons should be installed to the specified alignment and profile and securely held in position at intervals such that they will not be displaced during concreting. The tendons should be installed to a smooth alignment and profile without kinks. Tendons shall not deviate from their correct profile by more than 5 mm at any point. Proper care should be taken to avoid any damage to the sheathing. Minor damages to sheathing should be remedied by suitable adhesive tape. In case of major damage, the tendon should be removed and replaced.

Anchorages should be set square to the tendon axis and securely held in position to prevent movement during concreting.

(5) *Tensioning*

The requirements of Article 2.39(8) and 2.39 (9) shall be applicable.

Completed record sheets should be submitted to the Engineer while seeking approval for stripping of formwork and cutting off protruding tendons.

(6) *Protection of anchorages*

The requirements of Article 2.39(11) shall be applicable for the protection of anchorages.

(7) *Safety*

Adequate safety precautions should be taken during tensioning operations as per Article 2.39(12).

(8) *General requirements and stressing calibration equipment*

The requirements of Articles 2.39(13) and 2.39(14) shall be applicable.

2.41 Notes Concerning Measurements and Pricing Concrete Work

The Contractor must allow for costs incurred during the progress of the Contract for complying with the provisions concerning the preparation and use of specified grades of concrete 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 construction joints and 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 face 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 battens, struts, and supports and for bolting, jacking, wedging, casing, 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 include for strutting at any level.

Prices for steel rod reinforcement shall include for all wastes in 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, e.g. steel chairs. 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, e.g. steel chairs and all extra material in laps. Prices for steel rod reinforcement shall include for lengths up to and including 12 metres. Prices shall

include preparation of bending schedules and calculation of weights from reinforcement drawings, submission of the same for the Engineer's approval before commencement of their placing into works.

The prices for post tensioning work shall include tendons, ducts and vents, anchorages, their assembly/installation, stressing operations, grouting of ducts, protection of anchorages and all associated works required by the specifications/ drawings/contract documents and as necessary to complete the post-tensioning work. (In the case of post tensioning with unbonded tendons, provision of ducts and vents and their grouting are not required). Prices shall include for all wastes in cutting to required lengths and for handling, hoisting and fixing in position including all necessary tying wire, spacers, chairs and the like.

For calculation of increased costs due to change in prices of reinforcement bars, the wastage to be allowed for calculation will not be greater than 4% for bars up to size of 12 mm and 6% for bars of sizes above 12 mm, both of the weights measured from the schedule of reinforcement.

PART III

Mechanical and Electrical Engineering Services Specification

ELECTRICITY SUPPLY TO PROPOSED SEED STORE AT MOKA

TECHNICAL SPECIFICATIONS

This Section is intended to furnish a brief description of the electrical work pertaining to this Contract. The Nominated Electrical Contractor shall carry out the works to the full satisfaction of the Engineer and the Employer. He shall also fully collaborate with other traders and specialist Contractors and provide the necessary attendance for the smooth and effective progress of the work.

CONDUITS AND SUB CIRCUITS

All the wiring for light fittings, socket outlets and electrical power supply for other Mechanical Services shall be through concealed PVC Conduits and flexible conduit in dry wall partitions, floors and slabs.

LUMINAIRES

The Architect or Engineer reserves the right to alter the position of light fittings, if necessary during the progress of work at site. The Electrical Contractor shall be responsible of informing himself of the correct position of light fitting before fixing. Luminaires shall supplied by the Employer. The Contractor shall however quote for the fixing of all luminaires.

SPECIALISED SERVICES

It is anticipated that services of Specialist Contractors/ Suppliers may be available of in certain areas of the project which requires the coordination with the Electrical Contractor for power supply, conduit works, cable routing, etc. The Electrical Contractor shall provide the required attendance and support to these Specialist Suppliers/ Contractors for the timely execution of the project.

EARTHING SYSTEM If required

Earthing shall be provided generally in compliance with the latest Code of Practice and Standards Regulations. In addition, the relevant drawings shall be studied and complied with. However the enclosed specifications and drawings shall be taken as a general guidance only and it is the Electrical Contractor's responsibility to achieve the earth resistance value of two ohm (max) by adding counterpoise earthing if required, at no extra cost. All apparatus inc. luminaires shall be earthed.

ELECTRICAL ACCESSORIES

LIGHTING SWITCHES

Lighting switches shall be mounted alongside the Distribution Board

Switches shall be rated 10 amps minimum and shall be capable of controlling inductive loads without undue heating.

Switches shall be of the flush individually mounted to separate boxes.

Adjacent switches controlling different circuits or circuits on different phases shall be separated and shall not be mounted in the same box.

Switches and switch plates shall be of a modern style and design approved by the Architect and Engineer. Unless otherwise specified switch units shall be coloured white and scratch resistant.

Outdoor switches shall be selected from the weatherproof range and shall be of a design approved by Engineer.

Switches shall be of uniform pattern and design throughout the installation and shall preferable be from the same supplier. Samples to be submitted for approval by the Engineer prior to purchasing.

Lighting switches shall always be connected in the phase line and shall switch on the lights in the down position.

SOCKET OUTLETS

Industrial sockets one phase and three phase have been specified.
The sockets shall be installed adjacent to the proposed Distribution Board

POWER SWITCHES

Power switches shall be either 20A/30 & 45 Amp DP switches and fitted with pilot lights and flex outlet facility.

Power switches are to be mounted on boxes with a minimum depth of 48mm adjacent equipment to be controlled or where indicated on site by architect /Engineer.

Power switches are to be labeled appropriately indicated equipment served.

SWITCHBOARDS

GENERAL

Switch gear, distribution boards and associated equipment shall be so constructed and assembled as to provide reliable trouble free operation over the entire life of the building except for the climatic conditions prevailing on site.

All such equipment shall be selected for the capacity of the circuits to be served.
Switch gear and associated equipment shall be located in a well-ventilated place, away from all sources of humidity and dust, and shall be entirely accessible.

All live parts shall be fully enclosed and protected against possible accidental contact by operative personnel. The enclosures shall be vermin proof and passages for cables and connections with trunkings shall be efficiently sealed.

BUS BARS

Bus bars used for switchboards shall generally be rectangular shape and shall comply with relevant British Standard.

Bus bars shall be in high conductivity copper rated to carry the current corresponding to the full load rating of the incoming switch without excessive rise of temperature Reduced section for neutral shall not be permitted.

All live bus bars shall be protected inside the switchboard.

MINIATURE CIRCUIT BREAKERS (MCBs)

Miniature circuit breakers shall only be used for the protection of final sub-circuit and shall generally be of the single pole type + Neutral type or double pole type.

They shall be equipped with non-adjustable thermal overload and magnetic short circuit releases.

They shall be operated by toggle action on a latching mechanism and shall have quick tripping characteristics.

MCBs shall be of the rail mounting type and when connected to the same phase, the incoming sides shall be linked together by a common copper strip, with provision for supply lead connection in a suitable connection terminal or lug.

Two, three or four pole combinations can be obtained by ganged assembly of single pole breakers of the same rating with a common trip bar to trip all the poles simultaneously.

When specified, two, three or four pole Mcbs shall provide earth fault current protection in addition to overload and short circuit protection, by the integration of a suitable device.

Mcbs shall have breaking capacities of not less than 6 kA for units rated 5 to16 amps and 10 kA for units rated 20 to 63 amps, and shall include clear visual indication of the ON/OFF and tripped conditions.

Contacts shall be adequately rated to sustain the possible short circuit currents of the circuits being protected and all metal parts shall be in corrosion resistant material or suitably protected by plating or other approved means to prevent corrosion from normal atmospheric conditions.

All Mcbs shall as far as possible be of the same type and manufacture throughout the installation and shall be from a well known and approved supplier.

Mcb's shall be of Make Merlin Gerin or Legrand.

RESIDUAL CURRENT CIRCUIT BREAKERS (RCD)

The design and performance shall comply with BS4293 or latest amendment and suitable for 230/400 volts 50 Hz Ac system.

The units shall be double pole or four pole as required and mounted within the distribution boards.

The RCD shall automatically open the protected circuit in the event of an earth leakage fault between phase and earth equal to a greater than the fault current sensitivity rating of the device.

The sensitivity ratings of the RCD shall be 30 mA.

The selected RCD has to be complete with test button and trip re-set device.

All socket outlets circuits shall be protected by RCDs.

Low Voltage Cable

185 mm² four-core, stranded copper conductor, cross-linked polyethylene insulated, PVC sheathed, armoured with galvanised steel wires or tapes and black PVC sheathed overall 600/1000 volt grade and shall conform to the BS/EN standards: XLPE-insulated armoured cables to BS 5467
The cores shall be identified by colours or by numbers.

Installation of LV cables

Cables shall be run between termination points in continuous lengths. Joints will be allowed only where specified or with approval.
The Contractor shall supply all cable terminations with crimped lugs, bi metallic lugs where applicable

Cable Trays

Cable trays shall hot dipped galvanized steel conforming to requirements of BS 729. They shall be heavy duty perforated steel free from sharp edges and joints should be mechanically bolted using splice plates. Manufacturers' standard items - supports, bends, reducers, tees, etc. shall be used. Site fabrication shall be kept to a minimum and shall be subject to the approval of the M&E Engineer. Supports/hangers shall be spaced such that deflection (with all cables installed) does not exceed 10mm.
The cable trays shall be earthed along the whole lengths.

Extractor Fans

The idea of having air intake fan and extractor fan at high level will not improve general air circulation in the store. Air will mostly be renewed at high level.

Provide 2 nos. opening 2000mm x600mm wide on side of the store at low level complete with weather louvers and insect screening mesh for air intake by positive pressure .

The extractor fans shall be fixed on the rear wall between the windows at high level. 4 nos wall fixed extractor fans of capacity 3000m3 /hr each shall be required complete with outdoor weather louvers + insect screening mesh.

Testing and Commissioning

The Contractor shall test and commission all installed Installation accordance with the BS 7671: 2008 Requirements for Electrical Installations (17th Edition of the IEE Wiring Regulations) and MS 63: Requirements for Electrical Installations.

All tests shall be witness by the AMB or its representative.

The Contractor provide the Engineer with at least 2 working days' notice prior to witness all test.