
THE DISTRICT COUNCIL OF SAVANNE



OPEN NATIONAL BIDDING

for the

CONSTRUCTION OF ROADS WITH RETAINING WALLS

WITHIN THE JURISDICTION OF THE DISTRICT OF SAVANNE

FOR THE PERIOD ENDING 30 JUNE 2019

Procurement Reference No: *DCS/OAB/W003/18-19*

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Standard Bidding Document

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PART 1 – Bidding Procedures

Section 1 - Instructions to Bidders

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Section I - Instructions to Bidders

A. General

1. **Scope of Bid**
 - 1.1 The Public Body as defined¹ 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

¹ See Section IV, “General Conditions of Contract,” Clause I. 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 Act 2008, Contractors currently operating in the construction industry have the statutory obligation to be registered with the Construction Industry Development Board (CIDB) accordingly.
- (b) Subject to paragraph (e), 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 Rs500 000 or above are subject to registration as applicable to Contractors.
- (e) Paragraph (b) shall not apply to Foreign contractors who have been carrying construction works in the construction industry during the 20 years preceding 01 March 2017; and where at least two-thirds, or such other percentage as may be prescribed, of the total number of its or his employees are as citizens of Mauritius.
- (f) A Foreign contractor referred to in paragraph (e) shall, for the purpose of registration, make an application with the CIDB and obtain a valid registration certificate prior to bidding for this project.
- (g) 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 litigation, current or during the last five years, in which the Bidder was/is involved, the parties concerned, the issues involved, the disputed amounts, and awards; and
 - (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) duly registered with the CIDB under the grade that would allow him to perform the value of works for which he is submitting his bid
 - (b) registered with the CIDB under the class(es) and 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

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.

Section VI – General Conditions of Contract
 Section VII- Particular Conditions of Contract
 Section VIII - Contract Forms

- 7.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.
- 8. Clarification of Bidding Document**
- 8.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address **indicated in the BDS**.
- The Employer will respond in writing to any request for clarification, provided that such request is received 15 days prior to the deadline for submission of bids.
- Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 10.
- 9. Site visit/Pre-bid meeting**
- 9.1 Bidders, at the Bidders' own responsibility and risk, are encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing their Bids and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidders' own expense.
- 9.2 The Bidder or its designated representative is invited to attend a pre-bid meeting, as **provided for in the BDS**. The purpose of the pre-bid meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.
- 10. Amendment of Bidding 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 Quantities³ 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 14days prior to the deadline for submission of bids, shall be included in the rates, prices, and total Bid price submitted by Bidders.⁵
- 16.4 The price to be quoted in the Bid Submission Form shall be the total price of bid after any discount offered.
- The discount if any and the conditions of its application shall be indicated separately.
- 17. Currencies of Bid and Payment** 17.1 The bid price and rates shall be in Mauritian Rupees and fixed for the duration of the contract unless otherwise **specified in the BDS**.
- 17.2 Unless otherwise **specified in BDS** interim payment for Plant and Material on site is applicable as per GCC 39.7.

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.”

- 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 90days 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 **One Copy** 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 Arithmetical Errors**
- 31.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:
- (a) only for unit price contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
 - (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and

the total shall be corrected; and

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

32. Margin of Preference

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

33. Evaluation of Bids

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

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

- (a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively; and
- (b) price adjustment for correction of arithmetic errors, discounts, non-conformities, due to the supplementary criteria as defined in Section IV, and Margin of Preference, if applicable.

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

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

34. Comparison of Bids

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

35. Qualification of the Bidder

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

- 36. Employer’s Right to Accept Any Bid, and to Reject Any or All Bids** 36.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders.

F. Award of Contract

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

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

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

A. General	
ITB 1.1	<p>The Public Body is: <i>The District Council of Savanne</i></p> <p>The Works are the <i>Construction of Roads with Retaining Walls</i></p> <p>The name and identification of the Contract are <i>DCS/OAB/W003/18-19 – Construction of Roads with Retaining Walls</i></p> <p>The Project is <i>Construction of Roads with Retaining Walls within the Jurisdiction of The District of Savanne for the Period ending 30 June 2019</i></p>
ITB 1.2	The Intended Completion period is as per <i>Works Order to be issued</i>
ITB 2.1	The Funding Agency is: <i>The District Council of Savanne</i>
ITB 3.2	<p>(a) The address to file Challenges in respect of this procurement is The Chief Executive The District Council of Savanne Lady Barkly Street Souillac</p> <p>(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</p>
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	The information required from bidders in ITB Sub-Clause 6.2 is modified as follows: <i>All documents required under ITB 6.2.</i>
ITB 6.2 (g)	The assessment of the financial soundness of the company shall be on a pass/fail basis on its overall performance including its profitability.
ITB 6.3 (b)	<p>(A1)The Contractor shall demonstrate that it is registered with the CIDB under the following class(es): <u><i>Grade G or higher with the CIDB in Civil Engineering Construction Works</i></u> and specialization in the following area(s) <i>N/A</i></p> <p>In case the areas of specialization defined by CIDB do not cover the particular work, the criteria (A2) below shall also apply.</p>

ITB 6.3 (b)	(A2) <i>The Contractor shall also demonstrate that it meets <u>experience as prime contractor in the construction of a minimum of five (5) works of a nature and complexity equivalent to the Works over a period of last three (3) years.</u></i>																
ITB 6.3(c)	<p>The minimum essential equipment to be made available for the Contract by the successful Bidder shall be as follows:</p> <table border="1"> <thead> <tr> <th>Equipment</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Excavator</td> <td>2</td> </tr> <tr> <td>Truck (min 15 Tons)</td> <td>2</td> </tr> <tr> <td>Motorized Grader</td> <td>1</td> </tr> <tr> <td>Pneumatic Roller</td> <td>1</td> </tr> <tr> <td>Metal Drum Vibrating Roller</td> <td>1</td> </tr> <tr> <td>Paver</td> <td>1</td> </tr> <tr> <td>Vibrating roller</td> <td>1</td> </tr> </tbody> </table>	Equipment	Number	Excavator	2	Truck (min 15 Tons)	2	Motorized Grader	1	Pneumatic Roller	1	Metal Drum Vibrating Roller	1	Paver	1	Vibrating roller	1
Equipment	Number																
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Paver	1																
Vibrating roller	1																
ITB 6.3 (d)	<p>Key Personnel (minimum)</p> <ul style="list-style-type: none"> • <i>One Contract Manager registered as Civil Engineer with the Council of Registered Professional Engineers of Mauritius with a minimum of 5 years post registration experience.</i> • <i>One Site Agent holding a diploma in Civil Engineering or equivalent with a minimum of 5 years of experience.</i> • <i>One Foreman having at least 5 years of experience in Civil Works</i> 																
ITB 6.3(e)	<p>The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be Rs3.0Million.</p> <p>The bidder is required to produce documentary evidence from a recognized financial institution regarding his liquid asset and/or availability of credit facilities.</p> <p><i>Documentary Evidence from a Recognized Financial Institution shall be dated not more than one month prior to the date of submission of bids and shall mention the name of the contract. Bidders are also required to submit selected data extracted from these Audited Accounts/Financial Statements as per Annex.1.</i></p>																
B. Bidding Documents																	
ITB 8.1	<p>The Public Body's address for clarification is:</p> <p style="text-align: center;"><i>The Chief Executive The District Council of Savanne Lady Barkly Street, Souillac.</i></p>																
ITB 9.2	Pre-Bid meeting: <i>Not applicable</i>																

C. Preparation of Bids	
ITB 13.1 (f)	Any additional materials required to be completed and submitted by the Bidders are “None”
ITB 17.1	The Contract is not subject to price adjustment in accordance with GCC Clause 44
ITB 17.2	Interim Payment for Plant and Material on site is not applicable .
ITB 19.1	The Bid shall be valid for 90 days after the deadline set for the submission of bid, the deadline being counted as day one of the validity period.
ITB 20.1	Bid shall include a subscription to a <i>Bid Securing Declaration</i>
D. Submission of Bids	
ITB 23.1	The deadline for submission of bids shall be <u>Thursday 31 May 2018 by 14.00 hrs at latest</u> <i>Bids received after the closing date and time will not be considered.</i>
	The Employer’s address for the purpose of Bid submission is <i>The Administration Department The District Council of Savanne Lady Barkly Street Souillac</i>
E. Evaluation and Comparison of Bids	
ITB 26.1	The bid opening shall take place at: <i>The Council Room, The District Council of Savanne Lady Barkly Street Souillac</i> Date: <u>Thursday 31 May 2018 by 14.15 hrs at latest</u>
ITB 32	32.1 A Margin of Preference shall apply as defined hereunder and in Section IV-Evaluation Criteria. The following procedure shall be used to apply the Margin of Preference: (a) responsive bids shall be classified into the following groups: <ul style="list-style-type: none"> • Group A: bids offered by bidders meeting the conditions satisfying eligibility for a Margin of Preference , and • Group B: all other bids; (b) for the purpose of further evaluation and comparison of bids only, all bids classified in Group B shall be increased by the

	<p>percentage(s) of preference allocated to those in group A.</p> <p>32.2 Bidders applying for the Margin of Preference shall submit, as part of their bidding documents evidence of:</p> <ul style="list-style-type: none"> (a) their incorporation in the Republic of Mauritius; (b) their Joint Venture Agreement or intention to legally enter into a Joint Venture Agreement to be incorporated in the Republic of Mauritius, where applicable; (c) the percentage of the total man-days to be deployed by local manpower with break-down indicating type of works to be entrusted to the local manpower. (d) A financial statement signed by a certified Accountant vouching that the annual turn-over of the local Small and Medium enterprise (where applicable) does not exceed Rs 50M. (e) their deployment of manpower to demonstrate how they will undertake to employ the local manpower for the project. The evidence may include the number of existing employees that will be involved in the project and the number of workers that may be hired temporarily. <i>Non-submission of the evidence may entail non-eligibility of the bidder for margin of preference.</i>
F. Award of Contract	
ITB 40.1	The Standard Form of Performance Security acceptable to the Public Body shall be “a Bank Guarantee”. <u>The Bank guarantee shall be 10% of the value of each works order, inclusive of provisional and contingencies sum and VAT.</u>
ITB 40.3	For contracts up to 100M, the public body shall either retain money from progressive payments to constitute the preference security or request a security in the form of a bank guarantee at the selected bidder’s option.
ITB 41	N/A
ITB 42.1	Advance Payment shall not be Applicable for this contract.

Section III - Bidding Forms

Table of Forms

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Bill of Quantities	30
Construction of Roads with Retaining walls within the Jurisdiction of The District Of Savanne ...	30

Bid Submission Form

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

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

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

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) Clause 10;
- (b) We offer to execute in conformity with the Bidding Documents the following Works:
 _____;
- (c) The total price of our Bid after discounts, if any, offered in item (d) below is:
 _____;
- (d) The discounts offered and the methodology for their application are:
 _____;
- (e) Our bid shall be valid for a period of **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;⁶
- (l) We hereby *“apply/do not apply”* for Margin of Preference as provided in the bidding document;⁷
- (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: _____

Duly authorized to sign the
Bid for and on behalf of: _____

Date: _____

Seal of Company _____

⁶Use one of the two options as appropriate.

⁷Strike out as appropriate

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 District Council of Savanne 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.

Annex 1

Key Financial Information extracted from Audited Accounts/Financial Statements

Financial data in the currency reported in the Audited Accounts/Financial Statements	Historical Information			Remarks By BEC
	Previous years	Last Year	Current year	
Statement of Financial Position (Information from Balance Sheet)				
A. Current Assets				
B. Current Liabilities				
Working capital ratio or current ratio(A/B)				
Quick ratio or Acid Test ratio (Current Asset net of stock / B)				
C. Total Assets				
D. Total Liabilities				
Net Worth(C-D)				
Cash in hand and at Bank				
Bank Overdrafts				
Other Liquid Assets				
Information from Income statement				
Key Profitability Indicators in the currency reported in the Audited Accounts/Financial Statements	Previous years	Last year	Current year	
Turnover				
Profit /(Loss)Before Tax				
Taxation				
Net Profit /(Loss) After Tax				
(Net profit After tax)x 100 (Turnover)				
<u>Certified by Bidder that information are true extract from Audited Accounts/Financial Statements</u>				
Name:				
Signature:				
Capacity:				
Date:				

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]*

Valid Registration certificate from the CIDB: *[attach copy]*

Evidence of signatory authorized to sign the bid (if applicable):
[attach]

1.2 Where the specialization category for which the Bidder is required to be registered does not cover adequately the specialization required for the works Bidder shall provide *[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).]*

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)			

1.3 Major items of Contractor's Equipment proposed for carrying out the Works. *[List all information requested below. Refer also to ITB Sub-Clause 6.3(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)			

1.4 Qualifications and experience of key personnel proposed for administration and execution of the Contract. *[Attach biographical data. Refer also to ITB Sub-Clause 6.3(d).]*

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

1.5 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 Rs500 000 are duly registered with the CIDB in accordance with CIDB Act 2008.]

1.6 Financial reports for the last *[insert number; usually 3]* years: Financial Statements, Audited Accounts, etc. *[List below and attach copies.]*⁸

1.7 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of support documents.

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

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

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

1.10 Statement of compliance with the requirements of ITB Sub-Clause 5.3.

1.11 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 - 1.9 above shall be provided for each partner of the joint venture.

2.2 The information in 1.11 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.

BILL OF QUANTITIES

PREAMBLE

1. INTRODUCTION

- 1.1. The Bills are not and does not purport to be either exhaustive or explanatory of all the obligations and duties of the contractor who shall be deemed to have satisfied himself as to the correctness and sufficiency of the rates and prices stated in the bills all of which shall cover all his obligations under the contract and all matters and things necessary for the proper execution and completion of the works.
- 1.2. The contractor shall be deemed to have inserted against each item in the Bills such rates and prices as he may deem necessary to cover the requirements of the contract including labour, plant & equipment, overheads/profit. Where no rate or price is inserted against any item in the bills, the cost thereof will be deemed to have been included in other items priced by the contractor.
- 1.3. All measurements will be taken as net. The principle of net measurement shall apply to all works executed. All quantities measured for payment will be measured by the Project Manager or his representatives on the basis of actual quantities, in place of accepted works executed according to principle of net measurement.
- 1.4. Where the Bills do not include separate items for the Contractor's equipment, temporary works the contractor shall be deemed to have covered his obligations in these respects in the rates and prices for permanent works.
- 1.5. Items in the Bill of Quantities marked "Provisional" shall only be executed if they are the subject of a written instruction from the Project Manager. The rates set out for such items shall be used for the valuation for the works so ordered by the Project Manager in writing whether the quantities shown are used wholly or in part.
- 1.6. The net effect on the total contract price named in the Letter of Acceptance resulting from a difference between the provisional quantities entered in the quantity column of the Bill of Quantities and the items actually ordered by the Project Manager on site shall not be taken into account for the determination of the Contractor's right to a price/rate adjustment in accordance with clause 36(a) of the Conditions of Contract.
- 1.7. The Bills should be read in conjunction with the Specifications and Drawings.
- 1.8. **The Contract would be a rate contract. A first works order will be issued and the scope and amount of any additional works that would be undertaken remains at the discretion of the Employer without any liability or additional cost from the contractor.**
However the total amount of work may be allocated up to Rupees fifteen millions (Rs15M) exclusive of VAT.

BILL OF QUANTITIES

Construction of Roads with Retaining Walls

Within the Jurisdiction of The District of Savanne

Item No	Description	Unit of Measure	Rate <i>Incl of VAT</i> (Rs)
1	<p>SCARIFICATION AND COMPACTION The price quoted for this item shall include:- Scarifying, loosening and digging of any material from carriageway, shoulder, verge including topsoil; Clearance and demolition of existing concrete kerbs, dry stone kerbs and shrubs/bushes bordering the carriageway; Loading and carting away of excess materials to any distance or as directed by the Engineer; Shaping and compaction of the bottom of the excavation to 90% B.S. Heavy Compaction or as directed by the Engineer and Any miscellaneous costs arising.</p>	M ²	
2	<p>FELL TREES AND REMOVE STUMPS The price quoted for this item shall include:- Liaison with Forestry Department for clearance for felling of trees (List of trees to be approved by the Engineer). Felling of trees up to a girth diameter of 400mm and grubbing up roots; Clearing away felled trees and roots to stock pile and return to the Forest service or spoil tips as directed by the Engineer or disposed of by burning in areas approved by the Engineer. Back-filling of holes left by the roots with compacted materials approved by the Engineer to existing ground level or subgrade level and Any miscellaneous cost which may arise.</p>	No.	
3	<p>DEMOLITION OF MASONRY STRUCTURES, CONCRETE STRUCTURES, STONES WALLS The price quoted for this item shall include: Demolition of reinforced or unreinforced concrete or masonry structures including blockwall, masonry walls, concrete drains, hydraulic structures; Removal and transport of material to any distance to spoil tips as located by Contractor and approved by Engineer; Possible recuperation and reuse of demolished materials according to Engineer's instructions and; Any miscellaneous cost which may arise.</p>	M ³	
4.	<p>Harcore filling The prices quoted for this item shall include:- Supply, spread, level and mechanically compact using, a ten ton roller, hardcore filling consisting of hard stone not exceeding 200 mm in size Any miscellaneous costs arising.</p>	M ³	

<i>Item No</i>	<i>Description</i>	<i>Unit of Measure</i>	<i>Rate Incl of VAT (Rs)</i>
5.	EXCAVATION(excluding for items of works where excavation already forms part of the scope of work) The price quoted for this item shall include:- Excavate maximum depth 1.0m, wheel and deposit in spoil heaps. Rate to include for excavation in rock and in all types of strata, excavation for working space, earthwork support, compaction and backfilling using excavated material, disposal of surplus material and keeping all excavation free of water, mud etc by pumping, bailing etc including provision of all necessary pump and temporary plumbing. Excavation to be done with care so as not to cause damage to existing structures.	M ³	
6.	CONCRETE FOOTPATHS The price quoted for this item shall include:- Supply, spread, level and compact 150mm thick crusher run 0/20 including application of binder. Supply and Placing of 150mm thick Class 20 concrete including fixing of A252 mesh. Provide joints as directed by the Engineer and Any miscellaneous cost arising.	M ²	
7.	PRECAST (OR CAST IN-SITU) CONCRETE KERBS The price quoted for this item shall include: - Excavation in any material, including rock; Carting away of excess excavated materials; Supplying, fixing/placing of formwork, reinforcement and concrete; Curing of concrete; Striking of formwork; Back-filing and smoothing as required.		
(A)	Kerb K1	M	
(B)	Kerb K2	M	
(C)	Kerb K3	M	
(D)	Kerb K4	M	
8.	GRADED STONE BASE COURSE (average 200mm thick) The price quoted for this item shall include : Supply and transport to site of the crusher run (0/20) as required; Excavation, spreading out, watering, compacting of crusher run and subgrade as per specification; Levelling the surface (whatever the conditions) to the lines and levels as directed by the Engineer;	M ²	

Item No	Description	Unit of Measure	Rate Incl of VAT (Rs)
9.	<p>BITUMINOUS CONCRETE WEARING COURSE (0/10) WITH BINDER CONTENT min. 5.5 % (40 mm thick)</p> <p>The price quoted for this item shall include:- Preparatory works on the road being constructed which shall include sweeping and carting away to any distance of all materials to be disposed of; Supply, transport and spraying primer/tack coat at the rate of 0.6 kg/m² of cut-back bitumen as per specification; The supply and transport of bitumen, washed aggregates and filler to the Asphalt Plant; Making the asphalt concrete as per specification; Transporting the asphalt concrete to the site; Spraying, compacting and smoothing the asphalt concrete as per specification, including on narrow surfaces and other areas where this has to be done by hand; Trimming of the edges and any miscellaneous cost, which may arise.</p> <p>Rate to include for cores to be taken and tested as directed by the Engineer along each constructed roads).</p>	M ²	
10.	<p>MANHOLE RAISING</p> <p>The price quoted for this item shall include:- Excavation in any type of material; Demolition of the headwork or supporting slab or re-working the outer edge of the existing man-hole Supply on site of all the necessary plant and materials, erecting the formwork, fixing the reinforcement and placing the concrete as per specification; Curing of the concrete; Striking the formwork; Placing and adjusting the covers; Clearing the site and Trimming of the edges and Any miscellaneous cost which may arise.</p>		
(A)	Manholes where the internal size of the chamber is less than or equal to 500 mm	NO	
(B)	Manholes where the internal size of the chamber is greater than 500 mm	NO	
11.	<p>ROAD MARKING</p> <p>The price quoted for this item shall include:- Preliminary cleaning and marking out the pavement; Supply of road marking material and plant as per specification; Supply of traffic cones, temporary traffic signs for the proper regulation of traffic as directed by the Engineer; Painting the road surface as directed by the Engineer and Any miscellaneous cost, which may arise.</p>		
(A)	White hot melt thermoplastic 1.5 mm thick.	M ²	
(B)	Yellow hot melt thermoplastic 1.5 mm thick.	M ²	
(C)	White chlorinated rubber paint road marking.	M ²	
(D)	Yellow chlorinated rubber paint road marking	M ²	

<i>Item No</i>	<i>Description</i>	<i>Unit of Measure</i>	<i>Rate Incl of VAT (Rs)</i>
12	Retaining wall TYPE 1 as per drawings (height not exceeding 1000 mm)	m	
13	Retaining wall TYPE 2 as per drawings (height not exceeding 1500 mm)	m	
14	Retaining wall TYPE 3 as per drawings (height not exceeding 2500 mm)	m	

Priced Activity Schedule Authorised By:

Name / Name of Company:			
Address:			
Position:		Date:	
Authorised for and on behalf of:		Signature :	

Seal of Company

Rates shall include VAT, all labour, materials, taxes, charges, watchmanship, scaffolding, security measures, constructional plant, temporary access, temporary works, liaising with relevant authorities such as NTA, CWA, CEB, Wastewater Authority, Mauritius Telecom, Fire services, Police Force etc for placing of lanterns at night and all other requirements to carry out the works in accordance with the specifications and drawings including excavation, transport, carting away of debris, etc.

Note: In case roads are not accessible by paver, the works are to be carried out manually that is asphalt concrete to be spread manually and properly rolled

Section IV - Evaluation Criteria

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

1. Evaluation

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

(a) Adequacy of Technical Proposal

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

(b) Multiple Contracts

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

(c) Completion Time

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

(d) Technical Alternatives

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

(e) Margin of Preference

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

1.1 For International Bidding

A bidder, incorporated in the Republic of Mauritius, who undertakes to employ local manpower for 80% or more of the total man-days deployed for the execution of a works contract referred hereto, shall be eligible for a preference of 15%.

1.2 For National Bidding

(a) 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 Rs 50million who undertakes to employ local manpower for 80% or more of the total man-days deployed for the execution of the works contract referred hereto, shall be eligible for a Margin of Preference of 20%.

(b) Any bidder incorporated in the Republic of Mauritius not satisfying all the conditions mentioned in (a) above but undertakes to employ local manpower for 80% or more of the total man-days deployed for the execution of the works contract referred hereto, 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 for executing the works contract on the site.

Evaluation and Award of the Contract

The Tenderers must satisfy the requirements of the Tender Documents for their Tenders to be responsive. The evaluation shall be based on an assessment of the rates quoted.

A marking system will be used to assess the rates. For each item, the tenderer having submitted the lowest rate will obtain the maximum mark (see Table at Page 30 for schedule of markings). The other bidders will be allocated marks according to the following formula:-

$$M = \frac{M_{\max}}{R} \times R_{\text{lowest}}$$

R

Where

M is the mark to be allocated

M_{max} is the maximum mark allocated to the lowest rate

R is the rate under consideration

R_{lowest} is the lowest rate for the item under consideration

The rate given in the list of prices in words will be taken as the correct rate in case a discrepancy is noted between the rates in the schedule of rates and the list of prices.

For items that consist of several sub-items (e.g Item 4(a), 4(b), 4(c) etc), the calculation will be effected for each sub-item separately and the average mark of all sub-items will be calculated.

The bidders will be ranked in term of the highest total mark obtained.

The Employer is not bound to accept the highest scoring or any Tender that is submitted and shall not assign any reason for the rejection of a Bid.

SCHEDULE OF MARKINGS

MARKING FOR SCHEDULE OF MAIN RATES

ITEM	DESCRIPTION	UNIT	MAXIMUM MARK
1.	SCARIFICATION AND COMPACTION	M ²	10
2.	FELL TREES AND REMOVE STUMPS	NO	1
3.	DEMOLITION OF MASONRY, CONCRETE ETC	M ³	1
4.	SPALLS	M ³	4
5	EXCAVATION	M ³	1
6.	CONCRETE FOOTPATHS	M ²	1
7.	CONCRETE KERBS		
(A)	KERB K1	M	3
(B)	KERB K2	M	3
(C)	KERB K3	M	3
(D)	KERB K4	M	1
8.	GRADED STONE BASE (0/20)	M ²	10
9.	BITUMINOUS CONCRETE WEARING COURSE	M ²	45
10.	MANHOLES RAISING/DRAINS RAISING		
(A)	MANHOLE < 500 MM	NO	1
(B)	MANHOLE > 500 MM	NO	1
11	ROAD MARKING		
(A)	WHITE THERMOPLASTIC	M ²	1
(B)	YELLOW THERMOPLASTIC	M ²	1
(C)	WHITE CHLORINATED RUBBER PAINT	M ²	1
(D)	YELLOW CHLORINATED RUBBER PAINT	M ²	1
12	RETAINING WALL TYPE 1	M	5
13	RETAINING WALL TYPE 2	M	5
14	RETAINING WALL TYPE 3	M	1
	TOTAL MAXIMUM MARKS		100

PART 2 – Employer’s Requirements

Section V - Employer's Requirements

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Specifications

SECTION 1 – GENERAL

Third Party Obligations

The Contractor shall not demolish or otherwise interfere with any dwelling or building or anything connected therewith unless and until permitted to do so.

The Contractor shall take special care to prevent injury, damage, trespass on private lands, crops, fences, entrances, and other properties including the adjoining sites of other contracts adjacent to the works.

The contractor must make all necessary arrangements in this connection with adjoining land owners and other contractors or with the officer appointed for the purpose in case of Government property and assure the observance by his workmen of all regulations and laws appertaining thereto.

The Contractor shall make his own arrangements with the land owners concerned for access to the site of the works. Similarly the Contractor shall make his own arrangements for access to and for procurement of, any materials for the construction of the works.

The Contractor shall indemnify the Employer against all claims from failure to fulfill the above obligations and against all other claims arising from failures of a similar nature.

1.2 Works Executed by Employer or Other Contractors

The Employer reserves the right to execute, on site, works not included under this Contract and to employ for this purpose either his own employees or another contractor whose contract may be either a sub-contract under this contract or an entirely separate contract.

The Contractor shall ensure that neither his own operations nor trespass by his employees shall interfere with the operations of the Employer, or his contractor employed on such works and the same obligation shall be imposed on the Employer or Contractor in respect of work being executed under this Contract

1.3 Liaison with Police, forestry, CEB, CWA, Telecom and Other Officials

The Contractor shall keep in close contact with the Authorities of the areas concerned regarding their requirements in the control of workmen, movement of traffic, passage through urban areas, clearances, assistance or other matters, and shall provide all assistance or facilities, which may be required by such officials in the execution of their duties.

1.4 First Aid, Welfare and Safety Precautions

The Contractor shall provide equipment and maintain adequate First Aid Station on the site of the Works and provide all necessary transport and shall have experienced First Aid men available for attending minor accidents.

The Contractor shall allow in his prices and be responsible for the cost of all site welfare arrangements and health requirements.

Work is to be executed in a safe and responsible manner and the Contractor is to proceed in accordance with the provisions of the appropriate legislation. Particular attention is drawn to the need for adequate handrailing and fencing off dangerous areas, e.g., excavations on roads.

1.5 Alterations to and Preservation of Service

Where work is being carried out in the Jurisdiction of overhead power lines, the Contractor is responsible for ensuring that all persons working in such areas are aware of the relatively large distance that high voltage electricity can short to earth when cranes, or other large masses of steel are in the Jurisdiction. The Contractor's attention is drawn to BS 162 which states safe clearance for various voltages.

In all cases where such works are exposed, they shall be properly shored or hung up. Special care must be exercised in refilling to compact the ground under mains, cables, etc... and not to cover up exposed water meters and stopcock boxes, etc...

Poles supporting cables, adjacent to the Works, shall be kept securely in place until the work is completed, and then shall be made safe and permanent.

Should the Contractor expose any existing services which may interfere with or be damaged by the construction, he shall submit details of such services to the Engineer who will instruct the Contractor as to what measures are required to remove, alter, change or re-direct existing services. Precautions shall be taken to maintain the flow of water in streams, rivers, conduits and pipelines. The work required to protect services will be notified to the Contractor after approval by the relevant services authorities.

The foregoing requirements will apply equally to any work on services or roads completed by the Contractor in an earlier stage of the Contract.

Should any existing services be uncovered in the area of works, the Contractor shall be responsible for arranging, for the protection of such services including removal, modification or diversion if necessitated by the works, subject to the approval of the Engineer, to the services such as power lines, water lines, telephone lines, etc. (Prices and a provision sum for these works are included in the Bills of Quantities).

The Contractor shall also seek the approval from the authorities concerned whenever required.

Any damage to, or interference with existing services, occasioned during the progress of the Works, shall be deemed to be the responsibility of the Contractor, who shall undertake to make good at his own expense any damage so caused to the existing services or other features and shall be liable in respect of all claims arising from such damage or interference however occasioned.

1.6 Traffic Deviations, Traffic Control and Signs

The Contractor shall be responsible for the safe and easy movement of road and pedestrian traffic by day and night through the sections of the existing road where he is working.

The Contractor shall bear the cost of all these temporary warning signs of EUROPEAN STANDARD as may be necessary for the safety and direction of the Public as required by the Laws of Mauritius or local by-laws, or as ordered by the Engineer. All such arrangements shall receive the approval of the Engineer.

Provision for maintenance of traffic diversion will be the responsibility of the Contractor. The Contractor shall ensure that neither his own operations nor trespass by his employees shall interfere with the operation and maintenance of traffic diversions.

1.7 Programme to be furnished

The Contractor shall submit to the engineer for his approval:-

A general programme showing the timing order of procedure and general methods for carrying out the Works, with timing for mobilisation of equipment and plant and for purchase of important materials.

The mobilisation, staff, labour, equipment and plant proposed for the execution of the contract.

1.8 Setting Out

The Contractor shall be responsible for the full and proper setting out of the Works where required. Throughout the Contract, both the general and detailed methods of the complete setting out of the Works shall be submitted by the Contractor for the prior approval of the Engineer.

The Contractor shall ensure that all plant operators, gangmen and key men working on the site are made aware both of the positions of all important line and level marks and of the importance of reporting the least disturbance of the same. In the event of any reference marks being damaged or misplaced during the Works, then the contractor shall replace or reinstate such marks to the satisfaction of the Engineer.

The Contractor will be required to prepare and submit layout drawings, longitudinal and cross sections prior to the start of any part of the works. He shall also give the Engineer not less than 24 hours' notice, of his intention to set out or take levels for any part of the work before and after completion, so that arrangements can be made for checking. The Contractor shall provide all the necessary instruments, appliances, labour, etc., that the Engineer may require.

Throughout the Contract, both the general and detailed methods of the complete setting out of the Works shall be submitted to the Engineer for prior approval.

1.9 Temporary Works

The Contractor shall be wholly responsible for obtaining a site for his camps, offices, stockpiles of aggregates, constructional plant and other temporary Works, outside the road reserve and for making all payments in connection therewith.

All temporary buildings or stores and plant shall be located only on sites approved by the Engineer. The Contractor shall make his own arrangements with the land owners at his own expense.

All land to be permanently used or occupied by the Works will be provided by the Employer in whole at the start of works or in part as the works progress.

The Contractor shall maintain all offices required by his site Staff, workshops storage sheds, etc and clear away on completion of the Contract and leave the site in clean and tidy condition.

The Contractor shall provide latrines and ablutions for his employees, maintain them in a sanitary condition throughout the contract and clear away on completion and leave the site in clean and tidy condition. The Contractor shall be solely responsible for any living accommodation required by his employees.

When no longer required for the contract, all such provisions shall be left or dismantled and disposed of as directed by the Engineer and their Sites shall immediately be cleared and left as far as practicable in the same condition as that obtained immediately prior to occupation.

1.10 Maintenance of Existing Access and Service

The Contractor shall provide at all times, access for vehicles and pedestrians to their premises for owners and occupiers of land along the route of the works. Provision must be made to ensure that sanitary services remain unimpeded at all times.

The Contractor shall be responsible for the maintenance of the existing roads of which he has been given possession.

1.11 **Water and Electricity Supplies**

It is the Contractor's responsibilities to provide water and electricity for both construction purposes and also for the camps and offices. The Contractor's attention is drawn to the fact that no separate payment will be made for the provision of water and electricity and the Contractor shall be deemed to have included for these in his rates and prices. The Engineer may reject any water which in his opinion is contaminated and not sufficiently clean for the purpose intended.

1.12 **Nature of Ground and Conditions of Work**

The Contractor must satisfy himself as to the general circumstances at the site of the works and the construction thereon, the surface of the ground and nature of the materials to be excavated, the possibility of subsidence from soft ground and bad and broken materials, and falls of rock in or arising out of the Works, and the rates and prices in the Bills of Quantities will be held to cover all such contingencies.

1.13 **Faulty Work**

Any work which fails to comply with these Specifications shall be rejected and the Contractor shall at his own expense, make good any defects, as directed by and to the satisfaction of the Engineer.

1.14 **Protection of Works**

The Contractor shall take all steps necessary to protect the permanent Works and all stores and materials from the effects of weather, including floods and cyclones, theft, and shall be entirely responsible for any delay, damage or loss arising therefrom.

1.15 **Protection from Water**

The Contractor shall keep the whole of the works free from water and allow in his prices for all dams, cofferdams, pumping, piling, shoring, temporary drains, sumps, etc., necessary for the purpose and shall clear away and make good at his own cost and to the satisfaction of the Engineer all damage caused thereby.

SECTION 2 - SUB-STRUCTURES FOR DRAINS

2.1 EXCAVATIONS

Excavation shall consist of the loosening, digging, loading, hauling and disposal of all materials to the lines, levels, slopes and widths as shown in the drawings or as directed by the Engineer. It shall include compaction, finishing and shaping of all surfaces formed by such excavations.

Should any excavation be carried out to greater depth and dimension than necessary, the Contractor shall, at his own expense, reinstate and make good with approved material thoroughly compacted to a density not less than 95% BS Heavy Maximum Dry Density.

In wet weather, clayey ground shall not be excavated and shall not be taken down to less than 25 cm above final level of the sub-grade.

The Contractor shall take all necessary precautions to prevent slips and falls to the sides of the excavation. But, if any should occur, the Contractor shall remove, at his own expense, all such fallen or displaced materials and replace, if required, with suitable

materials compacted to a density nor less than that of the adjoining ground at his own expense.

All necessary precautions should be taken to protect existing C.W.A., M.T., C.E.B. or other services while carrying out excavation works. Should any damage occur to these services, same have to be made good at the Contractor's own cost to the satisfaction of the relevant authorities.

2.2. SOURCES OF MATERIAL

The Contractor shall be responsible for locating and providing materials for use. The Engineer's approval of the source and material must be obtained before the material is brought onto the site and incorporated in the works. The Contractor shall submit within 10 days of the allocation of tender the name of the crushing plant, quarry and other sources for the approval of the Engineer.

2.3 PREPARATION OF FORMATION

The formation shall be cleared of all foreign matter, and any potholes, loose materials, ruts, corrugations, depressions and other defects which have appeared due to improper drainage, traffic or any other cause shall be corrected and if directed by the Engineer, the Contractor shall scarify, water, grade and recompact the sub-grade to line and level all at his own expense. The surface of the sub-base layer shall be similarly treated and no base shall be laid until the underlying layer has been inspected and approved by the Engineer.

2.4 STONE SUB-BASE AND ROAD BASE MATERIAL

The aggregate shall consist of crushed stone which is tough and durable, roughly cubical in shape and free from excess of flat and/or elongated, particles of clay, top soil or other deleterious matter and shall be to the approval of the Engineer. The sub-base and road base shall conform to the grading requirements given in the following tables:

(I) Aggregates for Graded Crushed Stone Sub-base (0 - 31.5)

The grading of crushed basalt for sub-base shall be within the following limits:

NOMINAL SIZE OF THE SIEVE (mm)	PERCENTAGE OF WEIGHT PASSING
50	100
31.5	92 – 100
20	79 – 91
10	56 – 76
6	42 – 64
4	36 – 55
2	25 – 42
1	17 – 30
0.5	10 – 21
0.08	3 – 8

The Los- Angeles value shall not exceed 32.

The Sand equivalent value shall be more than 50.

(II)Aggregates for Graded Crushed Stone Road- Base (0 – 20)

The grading of crushed basalt for road-base shall be within the following limits:

NOMINAL SIZE OF THE SIEVE (mm)	PERCENTAGE OF WEIGHT PASSING
31.5	100
20	90 – 100
10	60 – 80
6	45 – 64
4	36 – 54
2	25 – 40
1	17 – 29
0.5	12 – 21
0.08	5 – 8

The Los- Angeles value shall not exceed 30.

The Sand equivalent value shall be more than 60.

The Flakiness index shall not exceed 40%.

All the materials shall be non-plastic.

All rolling shall be longitudinal and shall commence at the outer edges of the road, except that on super-elevated curves, rolling may progress from the lower to the higher edge. The surface of the material shall on completion of compaction, be well closed, free from movement under the compaction plant and free from compaction planes, ridges, cracks or loose material. All loose, segregated or otherwise defective areas shall be dug out and made good with new material to the full thickness of the layer and recompacted all at the Contractor's expense.

2.5 CONSTRUCTION LIMITATIONS

The layer on which graded stone is to be laid on a sub-base or road base shall be cleaned of all foreign matter. Potholes, loose material, ruts, corrugations, depressions and other defects which have appeared due to improper drainage, traffic or any other cause shall be corrected and if directed by the Engineer, the Contractor shall scarify, water, grade and recompact the layer to line and level all at his own expense.

No graded stone shall be laid until the underlying layer has been inspected and approved by the Engineer. A sufficient number of rollers shall be provided so that the rate of compaction of crusher-run material does not exceed 15 cubic metres of aggregate per roller per hour or as approved by the Engineer. Rolling shall be suspended if and when such rolling causes wave like motions in front of the roller.

2.6 TOLERANCES

The surface shall be checked with a 4 metres straight edge and no gap between the surface of the sub base, or of the road base and the straight edge shall exceed 15 mm. The average thickness of the layer measured at five points over a distance of 50 m, shall not be less than that specified and nowhere may the thickness be less than 90% of the specified thickness. The half width of the layer shall not be less than that specified and required by camber or super-elevation nor exceed the specified width by more than 50 mm. The finished surface level of the stone sub-base and road base shall nowhere be higher than required but may be up to 15 mm lower.

2.7 REPAIR TO SOFT SPOTS

The area to be repaired shall be marked out with a chalk or paint by drawing a rectangle around the damaged area. The materials within the marked area shall be excavated as specified in Section 2.1 and bottom of the excavated area shall be dressed flat and horizontal and compacted with a hammer.

The excavated area shall be backfilled and compacted in layers with graded stone material or sound and firm crushed spalls or maximum size of 200 mm as directed by the Engineer and according to specification.

SECTION 3- ASPHALT CONCRETE

3.1 BITUMEN

The different types of bitumen shall conform to the following Specification:

- | | |
|--------------------------|-----------------------|
| (a) Straight Run Bitumen | ASTM D946 |
| (b) Cut-Back Bitumen | ASTM D 2027 and D2028 |
| (c) Bitumen Emulsion | BS 434 |

Any bitumen or bitumen emulsion delivered in leaking containers or deteriorated in the containers will be rejected.

During the course of Contract, the Contractor shall, at his own expense, satisfy the Engineer from time to time that the bitumen and bitumen products being used in accordance with these Specifications. Any laboratory testing that he arranges to satisfy this clause, shall be carried out in an approved laboratory at no extra cost to the Employer.

3.2 PRIME COAT

The surface of the road base shall be, if required by the Engineer, first brushed completely free from all loose particles and surplus fines by mechanical brooms or other approved means so as to expose a closely knit, compact mosaic of stone and any foreign material shall be removed well clear of the edges. It shall be sealed with a prime coat of MC 30 cutback bitumen applied at a rate of approximately 1 l/sq m where bituminous concrete is to be laid. The rate of application may be varied by the Engineer and only the actual quantity shall be paid for. The rate and number of applications shall be such that the prime penetrates at least 1.5 cm the base course and dries to a uniform mat surface in 24 hours. The area to be primed shall extend 150 mm outside the area to be covered by the bituminous concrete. The base surface where too closely knit may be slightly

moistened by a mechanical sprinkler. During spraying of binder all road furniture, culvert head walls, kerbs and the like which are liable to be disfigured by splashing of bitumen shall be protected any such feature which is accidentally marred by bitumen shall be cleaned off with a suitable solvent or made good. Any areas insufficiently covered shall be resprayed by spray lance to satisfaction of the Engineer. Where the prime coat does not completely penetrate into the base, the excess should be blotted with sand or single sized aggregate 4/6. The prime shall be completely cured before spreading asphalt concrete or placing surface treatment.

The prime coat may only be applied after the Engineer has approved the surface. The finished surface of the road base course shall not be primed before 24 hours after the final compaction, but shall be primed within 14 days unless the Engineer instructs to the contrary. The bituminous base course and bituminous concrete road base shall not be laid less than 24 hours after the completion of the prime coat.

If the prime coat becomes contaminated or for some reason loses its tacking properties a tack coat may be ordered by the Engineer all in accordance with Sub-Section 5.05 and at the Contractor's expense.

3.3 TACK COAT

A tack coat shall be applied between the bituminous base course and wearing course or in the case of resurfacing works between the existing road surface and the reshaping course and between the reshaping course and the wearing course. The new tack coat may also be ordered by the Engineer at the Contractor's expense if the coated surface becomes contaminated by the action of traffic or weathering. The surface of the length to be tacked shall be swept clean of all loose particles and dust with a mechanical broom immediately prior to the application of the tack coat which shall comprise either RC 70 or rapid setting, bituminous emulsion applied at the rate of 0.5/sq.m.

3.4 RESHAPING

Before carrying out the resurfacing of any of existing roads, a reshaping using an open grade bituminous concrete to correct ruts, corrugations, grades and other defects shall be carried out as directed by the Engineer.

3.5 AGGREGATE FOR ASPHALT CONCRETE

Coarse Aggregates

Aggregates for bituminous materials (wearing course and base course) shall be obtained from approved source of homogeneous stone, free from harmful material, and shall consist of crushed rock of 37.5 mm minimum size prior to crushing.

The aggregates shall be obtained by mixing 3 classes D/d of materials defined for each class by the maximum size (D mm) and minimum size (d mm) of particles.

Dimensions D and d will be chosen in the following series of sizes: 2 – 6.3 – 10 – 14 – 20 – 25

Before the works start, the Contractor shall submit to the Engineer's approval, the grading curve of reference for each class of material.

The grading curve of reference shall satisfy the following requirements:

- (i) Percentage by weight of material retained by sieve D mm shall not be more than 10 %
- (ii) All material shall pass sieve 1.25 D mm.
- (iii) Percentage by weight of material passing by sieve d mm shall not be more than 10%.
- (iv) All material shall be retained by sieve 0.63 d mm.

Percentage by weight of material passing sieve (D +d) divided by two mm shall be within the range 33 – 67 %.

The total variations, by percentage, around the grading curve of reference for each class of material such as proposed by the Contractor at the commencement of works shall not exceed the following values:

For Pavement Course (wearing course and base course)

NOMINAL SIZE OF SIEVE (mm)	PERCENTAGE BY WEIGHT PASSING	
	WEARING COURSE	BASE COURSE
25	-	100
20	-	95 –100
16	-	91 -99
12.5	100	75- 91
10	94 – 100	51 –79
5	51 – 63	38- 57
2	32 – 42	23 –38
0.6	16 – 23	10 –19
0.08	7-9	5 -7

The Los Angeles value shall not exceed 25 for pavement.

The Sand equivalent value measured on 0/2 portion shall be more than 50.

The Flakiness index shall not exceed 25 for pavement.

Coral sand shall not be used.

The loss after 5 cycles of the Sodium Sulphate Soundness test shall be less than 12%.

Clean, cubical, hard and moderately sharp crushed sand free from clay, loam, organic matter or any injurious material, may be used with the approval of the Engineer to replace all or part of the aggregate smaller than 2.35 mm B.S. test sieve.

Rounded sand may be permitted to replace up to half the aggregate smaller than 2.36 mm with the approval of the Engineer.

3.6 FILLER

The filler for asphalt concrete shall be defined as the material passing the 75 micron B.S Sieve: For bituminous base course the filler may comprise either rock dust or a combination of rock dust and mineral filler. For bituminous wearing course the rock dust

filler shall not exceed 2 per cent by mass of the total aggregate including filler. The remainder of the filler shall be mineral filler.

The proportion of rock dust and mineral filler in the filler shall not be varied without the consent of the Engineer once the design mix has been approved.

3.7 MINERAL FILLER

Mineral filler for bituminous concrete shall be rock dust or ordinary Portland Cement to BS 812. At least 75% by mass shall pass the 75 micron B.S test sieve and the bulk density in toluence shall not be less than 0.5 g/ml and not more than 0.9 g/ml as measured in accordance with BS 812.

3.8 BITUMINOUS BINDER

The bitumen binder for bituminous concrete shall be straight run bitumen penetration grade 60/70. The bitumen for the different penetration grades, when tested in accordance with BS 598, AASHTO T164 or ASTM D 2172 method, shall conform to the following requirements:

	PENETRATION GRADE		
	40/50	60/70	80/100
Penetration at 25 ⁰ C 100g 5 sec (0.1 mm) (BS 2000: Part 49, ASTM D5, AASHTO T49)	40 – 50	60 - 70	80 –100
Specific gravity at 25 ⁰ C (BS 598 : Part 104)	1 – 1.1	1 – 1.1	1 – 1.07
Softening Point Ring Ball ⁰ C (BS 2000: Part 58, ASTM D2398, AASHTO T53)	47 –60	43 – 56	41 –51
Solubility in carbon tetrachloride	>99.5	>99.5	>99.5
Flash Point (Open Cup) ⁰ C (BS 4689, ASTM D92)	>250	>230	>230
Wax Content %	<4.5	<4.5	<4.5
Ductility at 25 ⁰ C (ASTM D 113, /AASHTO T51)	600	800	1000
Loss on heating 1630C 5hrs			
(i) % Loss	<1	<1	<2
(ii) Retained penetration	>70	>70	>70

3.9 ABSORPTIVE AGGREGATES

Where aggregates have water absorption in excess of 1% as measured in accordance with BS 812 or ASTM C127, some absorption of bitumen will occur that will affect the voids in the mix. In this case the voids in the mix and voids filled with bitumen are to be calculated using the specific gravity of the coated uncompacted mix determined in accordance with ASTM D2041.

3.10 MIX REQUIREMENTS

The working mixes for base and wearing courses shall comply with the following requirements from the Marshall Stability test ASTM D1559, AASHTO T 245 based on 75 blows compacted specimens:

	Base Course/ Reshaping	Wearing Course
Marshall Stability at 60 ⁰ C (kg)	800	1100
Flow (mm)	2 – 4	2 – 4
Voids in mixed aggregates (%)	14 – 18	16 – 20
Voids in total mix (%)	3 – 8	3 – 5
Voids filled with bitumen (%)	67 – 77	70 – 80

3.11 PREPARATION OF DESIGN MIX

At least two months prior to commencing work on each asphalt concrete layer and whenever changes occur in the nature or source of the bituminous concrete mix constituents, the Contractor shall submit to the Engineer full details of his proposed aggregates grading and bitumen content together with details of the Marshall mix design showing compliance with all of the above mix requirements. The Engineer will then either approve in writing or order changes to the submitted laboratory design mix. The approved laboratory design mix shall be confirmed by full scale plant trials using the full range of bitumen contents. The approved plant trial mix shall be termed the Job Standard Mix.

3.12 WORKING MIX

When the Job Standard Mix is approved by the Engineer, the Contractor shall maintain the composition of the working mix within the following tolerances from the Job Standard Mix.

- Bituminous binder Design mix + 0.1 to –0.2% by mass of total mix.
- Aggregate retained on 5 mm B.S Sieve : Design mix + 4% by mass of total mix
- Aggregate passing 5 mm B.S. Sieve but retained on 75 microns B.S. Sieve: Design + 3% by mass of total mix.
- Aggregate passing 75 micron B.S. Sieve: Design mix + 1.5% by mass of total mix.

The bituminous concrete shall be checked periodically and when ordered by the Engineer and shall comply with the above specified requirements.

3.13 MIXING AND LAYING

Bituminous concrete shall be prepared in a central mixing plant conforming to the requirements of ASTM designation D995. The mixing time shall not be less than that recommended by the plant manufacturer, or such longer time as may be required to ensure adequate coating of aggregate and uniform distribution of the bitumen through the mix. The mixing time is to be approved by the Engineer. The plant shall not be operated at a higher speed than the manufacturer's rated capacity. The plant shall be such that the mineral filler shall be kept dry and be separately stored and weighed. It shall be possible to introduce the filler separately into the mixer if required by the Engineer. All aggregates on leaving the drier shall have a moisture content of less than 1% by mass.

The temperature of the bitumen shall be such that its kinematic viscosity is in the range of 150 to 300 centistokes as it enters the mixer. At no time shall bitumen be heated in excess of 180 ° C and any that is so heated shall be removed from site at the Contractor's expense. The temperature of the aggregates, excluding the filler which shall not be heated before entering the mixer shall on entering the mixer be within the same range as for the bitumen but at no time shall its temperature vary by more than 15° C from that of the bitumen. The asphalt base and wearing courses shall be constructed in the layers of thickness shown on the drawings.

The mixture shall be laid by an approved mechanical paver and the temperatures of the mix at the time of the laying shall be between 120 ° C and 160 ° C. The pour shall at all times be adjusted and operated to eliminate segregation of the mix and to provide an even flow of mix across the full width of screed. The vibrating tamper or screed of the paver is to be arranged to apply the same degree of compaction across the full width of paving.

The speed of the paver and rate of supply of mix shall be matched so as to avoid stopping the paver between successive loads: the paver shall be operated to move up to the trucks transporting the mix, which shall either be stationary or moving in the same direction as the paver at the time of contract. When laying bituminous on gradients steeper than 4% the paver shall be operated in an up-hill direction.

3.14 COMPACTION

The mix shall be rolled immediately after laying and before its temperature has fallen below 105 ° C. The mix shall be given an initial pass of a light tandem roller and then rolling shall continue with pneumatic rollers. Such rolling shall be continued only for so long as it is effective and does not have any detrimental effect. The above minimum rolling temperature may be lowered at the discretion of the Engineer, but shall in no case below 100 ° C.

Rolling of the surface shall be continued until all roller marks are eliminated and a density has been obtained at least 98% of the density achieved on laboratory samples made from the plant mix used for the layer concerned and conforming to the design formula approved by the Engineer. The wearing course shall be given a finishing roll with a 12 T three wheeled steel roller. Care should be taken in the selection and use of rollers so as not to overcompact the layers.

3.15 TRIAL AREA

The Contractor shall arrange for a trial area of bituminous concrete to be laid in an area to the required thickness using the plant and methods to be used for the permanent surfacing to the full width normally produced by the plant and not less than 50 metres long. Samples shall be taken and tested in accordance with the relevant clauses of Section 1 from a representative part of the road base, base course and surfacing where directed by the Engineer.

In case, the trial lay fails to meet the design standards, the mix and/or workmanship shall be adjusted and new trial lays repeated until a satisfactory and specification complying layer is achieved, all to the expense of the Contractor.

At the risk of the Contractor the trial area may be laid as part of the permanent work. In that case any layer proved by tests to be defective shall be removed by the Contractor at his own cost. The Contractor shall allow for the cost of complying with the above in his tender.

3.16 JOINTS

Transverse joints in the wearing course shall be offset at least 1 m from those in the base course. Longitudinal joints shall be offset at least 150 mm. At transverse joints between existing compacted surfacing and newly laid surfacing the edge of the existing surfacing along the joint shall be neatly cut away in straight lines over a sufficient width to ensure that the full specified thickness of new surfacing is placed. The exposed edge in the existing work shall if directed, be painted with hot bitumen immediately in advance of placing the new work. Where the bituminous layers are laid in half widths, the longitudinal joints between them shall, if directed, be treated similarly to the transverse joints.

3.17 TOLERANCES

The compacted thickness and half-width of each layer of asphalt concrete shall not be less than that specified. For bituminous base courses the finished surface shall be checked with a 4.0 metre straight edge and there shall be no gaps between the asphalt base surface and the straight edge exceeding 8 mm.

For wearing course the final surface shall be a uniform texture and shall be checked with a 4.0 metre straight edge and there shall be no gap between the finished surface and the straight edge exceeding 4 mm. The surface level of the pavement at any point shall not deviate vertically from the true finished road surface as calculated from the vertical profile and crossfalls, shown on the Drawings or as directed by the Engineer, by more than + 6 mm.

3.18 WEATHER LIMITATIONS

Bituminous pavement materials shall not be mixed when the moisture content of the aggregate is such as to interfere with the uniformity of the mixing temperature or with continuous plant operations. It shall not be laid when the underlying layer is damp or dusty.

3.19 DEFECTS

Any defects in the bituminous work, caused by faulty workmanship or materials shall be corrected and made good at the Contractor's own expense. Care shall be taken when starting and stopping the paver to prevent the formation of humps and depressions. Any material that becomes mixed with foreign bodies, or is in any way defective, shall be removed and replaced with fresh material and compacted as specified.

For wearing course where the surface levels of the newly laid bituminous concrete fall outside the tolerances specified, the entire thickness of the wearing course shall be considered defective and shall be trimmed off and removed and fresh layer relaid in accordance with the Specification, all at the Contractor's own costs. Skin patching of an area that has been rolled will not be permitted.

3.20 TRANSPORTATION

The bituminous materials shall be transported from the mixing plant to the spreader in tripper trucks having tight, clean, smooth beds and sides which have been treated to

prevent adhesion of the mixture to the truck bodies. A thin film of soap water or approved lubricating oil may be used to prevent adhesion but gasoline, kerosene or other solvents shall not be used for this purpose. Deliveries shall be made so that spreading can be completed during daylight unless otherwise approved by the Engineer and appropriate and sufficient artificial lighting is provided. Hauling over freshly laid material will not be permitted.

3.21 PROTECTION

After final rolling no vehicular traffic of any kind shall be permitted on the surfacing for at least 24 hours or such longer times as may be ordered by the Engineer. No rollers or other plant shall be left standing on completed work.

3.22 CARRIAGEAWAY

The Contractor shall obtain confirmation and approval from the Engineer of the type of material to be used and the thickness to be provided on each road, and the terminal points, before any material is laid.

3.23 DOUBLE BITUMINOUS SURFACE TREATMENT

For surface treatment the rate of application of binder and chippings shall be determined on site according to type of binder and chippings. The following table gives the average rates upon which bill prices have to be based:

	CUTBACK RC 250 Kg/m ²	CHIPPINGS Litre/m ²		
		2/4	4/6	10/14
Single surface Treatment	1.0		8.0	
Double Surface Treatment				
1 st Layer	1.1			11.0
2 nd Layer	0.9		8.0	

The binder RC 250 or equivalent shall be sprayed mechanically by means of a pressure distributor after the road base has been cleaned as specified for priming.

The distributor shall be such that the spraying is uniform on an adjustable width. The spraying pressure shall be uniform whatever the running speed may be. A competent foreman shall continuously supervise the spraying of binder. All road furniture shall be protected.

Chippings shall spread mechanically immediately after the binder has been applied. A maximum delay of 5 minutes shall be authorised.

10/12 ton self propelled tyre roller shall be exclusively used. They shall make 3 to 5 passes, subject to approval of the Engineer.

When the surface dressing has been completed, all surplus material shall be swept away by mechanical brooms.

The rates shall be checked everyday for each layer of binder and chippings in cross section as well as in longitudinal direction. Nowhere the departure from the required rate shall exceed 10%.

SECTION 4 – CONCRETE WORKS

4.1 MATERIALS

This Section deals with reinforced and unreinforced concrete works, formwork and falseworks of any kind, and the reinforcement.

(1) Cement

Ordinary Portland Cement and rapid hardening Portland Cement shall comply with the requirements of MS 36: Portland Cement (Ordinary and Rapid-Hardening).

Each consignment of cement shall be accompanied by the manufacturer's certificate giving results of tests. If such certificate is not available, representative samples shall be taken from different bags or containers of each consignment, suitably packed and sent for testing, to prove its compliance with the requirements of MS 36 to an approved laboratory or where directed by the Engineer, all at the Contractor's expense.

All bagged cement shall be stored in a waterproof shed on a wooden floor raised at least 150mm above the surrounding ground and any Cement which shall have become injuriously affected by dampness or other causes shall at once be removed from the Site. Cement which has been rebagged either by the importing agent or by the Contractor, whether through the breakage of the original bag or any cause, shall not normally be accepted, but may be used in special cases and in certain parts of the work, if the written approval of the Engineer is first obtained.

(2) Aggregates

Aggregates for concrete shall consist of naturally occurring material complying with the requirements of BS-882 Concrete Aggregates from Natural Sources. The fine aggregates for concrete shall consist of clean sharp sand or crusher dust or a mixture of sand and crusher dust and shall not contain any iron pyrites, coal, mica, shale or similar laminated materials, flaky or elongated materials, shells and other porous or fragile particles, soluble matters, sulphates, alkalis and other deleterious materials in such a form or in a sufficient quantity as to affect adversely the strength or durability of concrete, or in addition to the above for reinforced concrete, any materials which would attack the reinforcement.

Aggregates shall be clean and free from adherent coatings, such as clay. The fine aggregate shall comply in all respects with the requirements of BS 882 for fine aggregate. The coarse aggregate shall consist of crushed or natural gravel or shingle or alternatively of broken hard, close grained stone of an igneous or other rock, to the approval of the Engineer. It shall be free from adherent coatings and shall, if necessary, be washed to achieve this, and shall conform to the following requirements:

(a) The amount of deleterious substance shall not exceed the following limits:

	Max. Permissible % by weight
Clay lumps	0.25
Material passing 75 micron BS Sieve	1.00
Calcium Sulphate expressed SO	0.25
Sodium Sulphate Soundness (BS 1438 Appendix B)Weight loss after 5 cycles	12.00
Thin or elongated pieces (length greater than 5 times average thickness)	15.00
Maximum Flakiness Index (BS 812 sieve method) For 35mm aggregates For 20mm aggregates	40 35

(b) The abrasion loss, as determined on representative samples in accordance with ASTM C131 shall not exceed 40%.

The aggregate crushing value, as determined on representative samples in accordance with BS 812, shall not exceed 35% as an average or 40% as an absolute maximum.

The drying shrinkage of the aggregate when tested in accordance with the British Building Research Establishment Standard test shall not exceed the following:

For precast	0.04%
For all other concrete	0.06%

(3) *Grading of Aggregate*

Fine Aggregate

(i) Grading of fine aggregates shall comply with Grading Zones given in the following table:-

Percentage by weight passing BS Sieve

BS Sieve Size mm	Grading Zone 1	Grading Zone 2	Grading Zone 3	Grading Zone 4
10	100	100	100	100
5	90-100	90-100	90-100	95-100
2.35	60-95	75-100	85-100	90-100
1.18	30-70	55-90	75-100	90-100
0.60	15-34	35-59	60-79	80-100
0.30	5-20	10-30	15-40	15-50
0.15	0-10	0-10	0-10	0-15

(ii) Any fine aggregate which does not comply with the requirements of these Specification shall be immediately removed from the Site or placed in a stockpile for use in other parts of the Works, if it complies with the requirements thereof, as directed by the Engineer.

Coarse Aggregate

(i) The Contractor shall arrange for the delivery of the coarse aggregate to Site in separate nominal sizes. The grading of such nominal size of aggregate shall be in accordance with the requirements indicated in the following table:

Percentage by weight passing B.S Sieve

BS Sieve Size	Nominal size of single sized aggregate				
	63mm	38mm	20mm	12mm	9.5mm
75mm	100				
63mm	85-100	100			
37.5mm	0-30	85-100	100		
20mm		0-20	85-100	100	
14mm				85-100	100
10mm		0-5	0-20	0-45	85-100
5mm			0-5	0-10	0-20
2.36mm			0-2	0-2	0-5

(ii) For Class 15(40) concrete, volumetric proportioning of coarse aggregate and of fine aggregate will only be permitted at the Engineer's discretion.

For all other concrete mixes the Contractor will be required to produce coarse aggregate grading by weight batching the single sized aggregates.

(iii) The single-sized aggregate shall be combined in proportions to give overall gradings for coarse aggregates in accordance with the requirements of BS 882 as set out in the following table:

Percentage by weight passing B.S Sieve

BS Sieve Size	Nominal size of single sized aggregate		
	30mm to 5mm	20mm to 5mm	12mm to 5mm
63mm	100		
37.5mm	95-100	100	
20mm	30-70	95-100	100
14mm			90-100
10mm	10-35	25-55	40-85
5mm	0-5	0-10	0-10

(iv).The amounts or proportions of each single-sized aggregate to be combined to form the coarse aggregate shall be varied from time to time as may be rendered necessary by the nature and source of the coarse and fine aggregates adopted by the Contractor, in order to produce at all times a concrete of the maximum density and workability with the minimum water cement ratio.

(v) No claim of any kind will be accepted in respect of any such variation in the amounts or proportions of the single-sized aggregates and the Contractor shall allow in his tender for such variations. Under no circumstances shall more than one single-sized aggregate be delivered to the place of gauging in one truck or lorry.

(4) Storing of Aggregates

Aggregate shall be stored in single sizes in separate bins or on areas covered with tightly laid wood planks, sheet metal, hard compact gravel, concrete or other hard and clean surfaces, which surfaces shall be self-draining, and in such a manner that will preclude the inclusion of foreign material. Aggregate of different gradings and sizes and from different sources shall be stored in separate piles and if these piles are close together they

shall be separated by bulkheads. Adequate stocks of fine aggregates shall be maintained to ensure uniformity of moisture content when used.

The Engineer shall have the power to reject any aggregate which does not conform to the above requirement. Rejected materials shall be immediately removed from site or disposed of at the expenses of the Contractor. The variation of grading between the approved samples and subsequent consignments of single-sized aggregate shall not exceed 5 per cent.

4.2 NORMAL CONCRETE MIXES

Concrete mixes shall be designed in accordance with "Design of Normal Concrete Mixes" 1976, published by the UK Department of the Environment, or in accordance with other approved method.

4.3 STANDARD MIXES

- (i) The concrete shall attain the strength shown in Table No. 5, both in the test cubes and throughout the whole of the placed work. The cement content must not fall below the minimum specified in Table No. 5.
- (ii) Aggregates shall be batched by weight for all classes of concrete and hoppers shall be an approved adjustable type. With the written approval of the Engineer, volume batching may be permitted for batching aggregates for concrete Class 15(40). Where aggregates are batched by volume, stout gauge boxes, approved by the Engineer, shall be used. The volume of the gauge boxes shall take into account the bulking of the aggregates.
- (iii) When bagged cement is used, the total volume or weight of aggregates per batch shall be such that a whole bag of cement is utilised; the use of cement from broken bags will not be permitted. When cement in drums or from a bulk-silo is used, the batching of the cement shall be by weight.

CONCRETE SCHEDULES

Concrete Class	Minimum Concrete Strength Strength N/mm ²		Minimum Cement Content Kg/m ³	Part of Works
	7 days	28 days		
15(40)	10	15	250	Blinding Layer Surround to pipe
20(20)	14	20	290	Concrete Bedding Backing to kerb
25(20)	17	25	340	Kerbs Bases to Post
30(20)	20	30	400	Culverts Bridge Decks

Notes

1. The class of concrete is denoted by the specified minimum 28 days cube strength, in N/mm² of the works cubes. The maximum size of aggregate is 20mm for all mix classes except for class 15(40) where 40mm maximum aggregate size is allowed.

2. The design mixes are based on Portland cement complying with MS 36 or BS 4027, and natural aggregates complying with BS 882. No special cement or light weight aggregates are to be used.

4.4 MIXING WATER

Mixing water for use with cement shall be from a source and of a quality approved by the Engineer. It shall be clean and free of oil, acid, alkali, salt, organic matter or other deleterious substances.

4.5 WATER/CEMENT RATIO

The quantity of water used for each class of concrete shall be just sufficient to produce a dense concrete of adequate strength and workability for its purpose. The moisture content of the coarse and fine aggregate in stockpiles shall be periodically determined as directed by the Engineer, and due allowance for the water present in them shall be made when determining the amount of water to be added at the mixer.

4.6 MIXING ON SITE

Unless otherwise authorised by the Engineer, concrete shall be machine mixed at the Site.

Concrete shall be thoroughly mixed in a mixer of an approved size and type which will ensure a uniform distribution of the materials throughout the mass. The mixer shall be equipped with adequate water storage and with a device for accurately measuring and automatically controlling the amount of water used in each batch. A mechanical means shall be provided for recording the number of revolutions for each batch and automatically preventing the discharge of the mixer until the materials have been mixed to the approval of the Engineer.

The entire contents of the mixer shall be removed from the drum before materials for a succeeding batch are placed therein. No mixer having a rated capacity of less than one batch shall be used nor shall a mixer be charged in excess of its rated capacity. All concrete shall be mixed for a period of not less than 1 minutes after all materials, including water, are in the mixer. During the period of mixing, the mixer shall operate at the speed for which it has been designed, but this speed shall not be less than 14 nor more than 20 revolutions per minute.

Prior to producing the first daily batch of concrete to be used in the works, or after the mixer has been cleaned, the mixer shall be operated with a sufficient quantity of water, cement and aggregates to thoroughly coat the inside of the mixer drum, to obviate a deficiency of these materials in the first batch of Works concrete produced. On completion of this coating process, the coating batch shall be removed from the mixer and deposited in an approved location away from the Works. Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned before further concrete is mixed. The mixing plant and concrete transporting equipment shall be thoroughly cleaned before changing from one type of cement to another. The contractor will allow in his tender for all costs involved in complying with the above requirements.

4.7 READY MIXED CONCRETE

Ready mixed concrete, as defined in BS 5328 and batched off the site may only be used with the approval of the Engineer and shall comply with all requirements of the Specification. Ready mixed concrete shall be mixed and delivered to the site of the works by means of one of the following combination of operations:

- (a) Mixed completely at a central plant and the mixed concrete transported to the point of delivery in truck agitators.
- (b) Mixed partially at a central point and the mixing completed in a truck mixer.
- (c) Mixed completely in a truck mixer.

Mixing at a central plant shall conform to the requirements for mixing on Site. The organization supplying premixed concrete shall have sufficient plant capacity and transporting apparatus to ensure continuous delivery at the rate required. Mixers may be stationary mixers or truck mixers. Agitators may be truck mixers operating at agitating speed or truck agitators. Each mixer and agitator shall have attached thereto in a prominent place a metal plate or plates on which is plainly marked the various uses for which the equipment is designed and the manufacturer's guaranteed capacity of the drum or container in terms of volume of mixed concrete and the speed of the rotation of mixing drum or blades.

Truck mixers, unless otherwise authorised by the Engineer, shall be of the revolving drum type, watertight, and so constructed that the concrete can be mixed to ensure a uniform distribution of the materials throughout the mass. All solid materials for the concrete shall be accurately measured as specified and charged into the drum at the proportioning plant.

Except as subsequently provided, the truck mixer shall be equipped with a tank for carrying mixing water.

Only the prescribed amount of water shall be placed in the tank unless the tank is equipped with a device by which the quantity of water added can be readily verified. The mixing water may be added directly to the batch, in which case a tank shall not be required. Truck mixers may be required to be provided with means by which the mixing time can be readily verified by the Engineer.

Concrete transported in a truck mixer, agitator, or other transportation device shall be discharged at the site and placed in its final position in the forms within 45 minutes after the introduction of the mixing water to the cement and aggregate or the cement to the aggregate except that in hot weather or under other conditions contributing to quick setting of the concrete, the maximum allowable time may be reduced by the engineer. The maximum volume of mixed concrete transported in an agitator shall be in accordance with the specified rating.

4.8 HANDLING AND PLACING OF CONCRETE

(1) General

In preparation for the placing of concrete, all sawdust, chips, and other construction debris and extraneous matter shall be removed from the interior of forms. Struts, stays and braces, serving temporarily to hold the forms in correct shape and alignment, pending the placing of concrete at their locations, shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. These temporary members shall be entirely removed from the forms and not buried in the concrete.

No concrete shall be placed until the Engineer has approved the formwork and reinforcement. The Contractor shall give at least 24 hours notice to the Engineer of the times he proposes to concrete and the Engineer may order that no concreting shall take place until either he or his representative is present. No concrete operation shall fall in a weekend or on a public holiday except absolutely necessary and unless written approval of the Engineer is priorily obtained.

(2) Handling

Concrete shall be transported in watertight containers in such a manner that will avoid the segregation of the constituent materials. The time elapsing between the initial mixing of the concrete and final placing in the work shall not exceed 45 minutes when Portland Cement is used. Where other cements are used, the Engineer will stipulate the maximum time allowed. Concrete remaining unplaced at the end of this period shall not be placed in the Works but shall be removed from the Site and disposed of at the Contractor's expense.

(3) Placing

Concrete shall not be dropped through a height exceeding 1.5 metres. For lowering concrete through heights in excess of 1.5 metres special methods shall be used, such as chutes, tremies, bottom dumping hoppers or bagged placing and only with the approval of the Engineer. All containers, troughs, chutes and apparatus through and in which the concrete is passed shall be kept clean and entirely free from hardened concrete or cement and free from contamination by extraneous material, and where there is an interruption of concreting exceeding 30 minutes, these shall be cleaned and hosed down with water.

When Concrete is placed in horizontal layers it shall not be more than 300mm thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding batch has taken initial set to prevent injury to the green concrete and avoid surfaces of segregation between the batches.

Each layer shall be compacted so as to avoid the formation of construction joints with a preceding layer which has not taken initial set. When in-situ concrete has been in place for 4 hours no further concrete shall be placed against it for a further 20 hours.

The concrete placed immediately adjacent to existing concrete shall contain only two-thirds the normal quantity of coarse aggregate, and shall be thoroughly compacted and worked against the existing concretes. A competent steel fixer shall be in attendance the whole time concrete is being cast around reinforcement.

Immediately following the discontinuance of placing concrete, all accumulations of mortar splashed upon the reinforcement steel and the surface of forms shall be removed.

Dried mortar chips and dust shall not be puddled into the unset concrete. If the accumulations are not removed prior to the concrete becoming set, care shall be exercised not to injure or break the concrete steel bond at and near the surface of the concrete, while cleaning the reinforcement steel.

4.9 COMPACTION OF CONCRETE

Concrete during and immediately depositing shall be thoroughly compacted to produce a dense homogeneous mass. The compaction shall be done by mechanical vibration subject to the following provisions:

- (i) The vibration shall be internal unless special authorisation of other methods is given by the Engineer or as provided herein.
- (ii) Vibrators shall be of a type and design approved by the Engineer. They shall be capable of transmitting vibration to the concrete at frequencies of not less than 4,500 impulse per minute.
- (iii) The intensity of vibration shall be such as to visibly affect a mass of concrete of 25 mm slump over a radius of at least 450mm to 600mm.

- (iv) The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.
- (v) Vibrators shall be manipulated so as to thoroughly work the concrete around the reinforcement and embedded fixtures, and into the corners and angles of the forms. Vibration shall be applied at the point of deposit and in the area of freshly deposited concrete. The vibrators shall be inserted and withdrawn out of the concrete slowly.
- (vi) The vibration shall be of sufficient duration and intensity to thoroughly compact the concrete, but shall not be continued at any one point to the extent that localised areas of grout are formed. Application of vibrators shall be at uniformity spaced points and not farther apart than twice the radius over which the vibration is visibly effective.
- (vii) Vibration shall not be applied directly or through the reinforcement to sections or layers of concrete which have hardened to the degree that the concrete ceases to be plastic under vibration. It shall not be used to make concrete flow in the forms over the distances so great as to cause segregation, and vibrators shall not be used to transport concrete in the forms.
- (viii) Vibration may be supplemented by such spading as is necessary to ensure smooth surfaces and dense concrete within the forms.

4.10 PROTECTION AND CURING OF CONCRETE

Immediately after compaction and for 10 days thereafter concrete shall be protected against harmful effects of weather including rain, drying winds, rapid temperature changes, running or surface water and shockloads. It shall be protected by keeping it covered with damp hessian, straw, damp sand or other approved material and kept moist. All curing methods to be used shall be subject to the approval of the Engineer. The formwork shall also be kept damp and, if struck earlier than seven days, shall be replaced for the remaining period with other approved damp material.

All concrete surfaces in contact with earth fill material shall be waterproofed with two coats of approved bituminous emulsion, either brushed or sprayed on, and on such surfaces curing membrane shall not be used. Care shall be taken to ensure that no bituminous paint where used is exposed to view after backfilling of the structures. All unsightly marks or spray shall be removed and the concrete made good at the Contractor's expense.

4.11 TOLERANCES

The concrete work shall be constructed as accurately as possible and the following tolerances will be permitted in the finished concrete work:

- i. in the cross-sectional dimensions of structures not more than 3 mm.
- ii. in dimensions, other than cross-sectional dimensions of structures not more than 6 mm.
- iii. in any surface the irregularity shall not exceed 6mm measured from a 3m long straight edge.
- iv. no member shall be out of line by more than 6 mm.
- v. no wall shall be out of plumb by more than 0.1% or, if battered, out of batter by more than 6 mm in 6 m heights.

4.12 SAMPLING AND TESTING

Immediately on starting production on site, samples of concrete shall be taken as follows: On each of the first 4 days of concreting, for each class of concrete, shall be made 6 test cubes from 2 separate samples. Three test cubes from each samples to be tested at 7 days, the other 3 at 28 days. One test result shall be the average crushing strength from the three cubes in the same sample, tested either at 7 days or at 28 days.

For the concrete to be acceptable the following conditions must be satisfied.

- a) not more than one individual result in the same test shall fall below the specified works cube strength.
- b) no individual result to fall below 90% of the specified works cube strength.
- c) no test result (average of three cubes in one sample) to fall below the specified works cube strength.

When at least 4 consecutive working days concrete production has been proved satisfactory, the frequency of testing may be reduced at the Engineer's discretion. The frequency and number of tests required by the Engineer for any concrete subsequently used in the Works will be at the discretion of the Engineer, and the Contractor will be deemed to have included for all costs required in the carrying out of the tests for trial mixes, and subsequent concrete quality control tests, in his tender for all parts of the Works, and for the whole duration of the contract.

4.13 LOADING CONCRETE STRUCTURES

No concrete structure will be subjected to loading including its own mass which will induce a compress stress of one third of its compressive strength at time of loading or of the specified 28 days strength.

4.14 FAULTY CONCRETE

Any concrete which, in the opinion of the Engineer, fails to comply with the Specification shall be declared defective, and shall be cut out, removed from the site and any steelwork, reinforcement or other material damaged by the cutting out shall be replaced to the approval of the Engineer and at the Contractor's expense. The Contractor may submit to the Engineer details of his proposals for rectifying the defects and shall comply with the Engineer's instructions regarding the method of carrying out the work. Notwithstanding the Engineer's approval, should the remedial work prove again unsatisfactory, the Contractor shall further make good all defective and rejected work at his own expense.

4.15 PRECAST CONCRETE

(1) General

Precast concrete structural members shall generally comply with the requirements of British Standard Code of Practice 116, except where varied by the requirements of these Specification or the Drawings.

The Contractor shall set up on Site an adequate precasting yard undercover, capable of handling all the precast concrete works and shall provide a suitably qualified Engineer to supervise the working on the yard all to the satisfaction of the Engineer. The contractor shall provide full details and drawings showing his proposals for the precasting yard, and until approval is given in writing no work on erection of the yard or producing precast concrete shall commence.

(2) Concrete Grades

Concrete grades shall be all as shown on the Drawings and in accordance with the Schedule of Concrete Mixes.

(3) Casting Method

The precast units shall each be cast complete in one operation, on suitable and sufficient platforms and moulds, all to the satisfaction of the Engineer. Before casting is commenced the Contractor shall submit, for the approval of the Engineer fully detailed drawings showing the proposed layout of casting beds, together with the details of the method of assembling and dismantling of the moulds, and lifting assembly of the units.

In cases where the finished thickness of the concrete is small, and compaction by internal or surface vibration will be difficult, the mould may be constructed so that external vibration of the shutter will satisfactorily compact the concrete, or vibrating tables may be used. The soffit shutter shall be adequately supported to prevent any settlement which might cause cracking of the concrete.

Provision shall be made to hold firmly and maintain in position all projecting reinforcement, bolts, screwed sockets and lifting holes, so that they are correctly located in the completed unit or member concerned.

(4) Weather Protection and Curing

The precast units shall at all times be cast under suitable shelter to provide complete protection from the sun, rain and drying winds. They shall remain under the shelter for at least seven days or until the units are strong enough to be lifted from the casting beds, whichever is the longer period. Similar to in-situ concrete, all exposed precast concrete shall be protected and cured as described in Sub-section 6.12. Thereafter, the units may be transferred to a storage area or be erected in their final position.

(5) Surface Finishes Generally

The methods used for compacting the concrete must be such that pinholes or airholes on the surface are avoided. Upon removal of the formwork, any units having a concrete face with rough, uneven, segregated, honeycombed or imperfect finish, or which shall be permanently discoloured, may be rejected at the Engineer's discretion. Where carrying out of remedial work is approved by the Engineer, irregularities shall be eliminated by grinding, or where an area shows airholes, these shall be filled and thoroughly rubbed over to leave the desired surface. Unsightly encrustations and stains shall be removed from all exposed surfaces. Remedial work of all kinds must be carried out strictly in accordance with the Specification and any further instructions which may be given by the Engineer. Any units which are rejected shall be disposed of away from the Site at the Contractor's expense.

(6) Lifting and Handling of Units

No items may be lifted from the casting beds until they have gained sufficient strength to avoid damage through lifting, handling, stacking or erection. Notwithstanding any guidance given by the Engineer on the concrete strength necessary to prevent damage, the Contractor shall be entirely responsible for the sufficiency of strength of units before lifting. Any items found damaged or cracked during and after lifting operation will be rejected by the Engineer, and rejected items must not be incorporated in the works and must be disposed of and replaced at the Contractor's expense.

Before casting, the Contractor shall submit to the Engineer, for his approval, full details of the proposed method of hoisting precast units including the location of proposed lifting

points. The contractor shall be responsible for the design and provision of extra reinforcement that may be required to facilitate the handling of the precast units and his tendered price shall include for this. The edges of precast units shall be protected by tenders of timber or other approved material during the lifting, handling and erection stages.

(7) *Stacking of Precast Units*

Where members are stored; they shall be firmly supported at such bearing positions that will ensure that stresses induced in them are always less than the permissible design stresses. Ample space is to be provided for the storage and stacking of the units. Units shall not be walked on or come into contact with the ground or with dirty or greasy hands or with ropes and cables. Nor shall wet slabs come into contact with dirty packs or pieces of timber which will discolour them. The units shall be stacked in such a way that the faces are protected both from damage and from staining. Where precast units have reinforcement left projecting, great care must be taken to ensure that any rust from these bars will not stain the finished concrete surfaces.

(8) *Tolerances*

The dimensional tolerances shall be in accordance with the requirements of British Standard Code of Practice 116, except where otherwise specified or indicated on the Drawings.

4.16 FORMWORKS

All formwork shall be approved by the Engineer before casting in-situ concrete.

4.17 STEEL REINFORCEMENT FOR STRUCTURES

All reinforcing steels shall conform to MS 10. The Contractor shall, when called upon by the Engineer, provide representative sample pieces for testing.

Alternatively, the reinforcement of concrete may comply with the following requirements:

Hot rolled Mild Steel	BS 4449
Medium Tensile Steel	BS 4449
High Tensile Steel	BS 4449
Cold Worked Steel	BS 4461
Steel Fabric	BS 4483
Stainless Steel	BS 970

All reinforcement shall be from an approved manufacturer, and, if required by the Engineer, the Contractor shall submit a test certificate of the rolling. The Contractor shall when requested by the Engineer, provide sample pieces for testing in an approved Materials Testing Laboratory, all at the Contractor's expense.

All reinforcement shall be free from scale, rust, grease, paint or other substances likely to reduce the bond between the steel and the concrete.

When placed in the Works, reinforcement shall be free from coatings of dirt, detrimental scale, paint, oil or other foreign substance.

Reinforcement shall be stored off the ground and be protected from rusting, coatings of deleterious material and excessive distortions. Any bar that, in the opinion of the Engineer, has been adversely affected by storage shall be cleaned, or removed from the Site and replaced by the Contractor at his own expense.

Bar reinforcement shall be cut and bent to shapes shown on the Drawings and according to bending schedules, prepared by the Contractor and approved by the Engineer.

The reinforcement shall be fixed rigidly and accurately in the forms in accordance with the details shown on the Drawings so that the specified spacing and concrete cover are maintained throughout.

No concrete shall be deposited in the forms until the Engineer has inspected the reinforcement and has given permission to place concrete.

4.18 CONCRETE DRAINS

Precast concrete drains shall be constructed to the cross section shown in the drawing in lengths not exceeding 2 metres, and the ends shaped so as to interlock with each other. The joints shall be mortared and rubbed down to a smooth finish. The top edge of the wall shall be carefully finished smooth and level so that any precast covers placed on it will not rock.

In built-up areas where drains will be provided along the road, the Contractor will have to realign CWA house service connections under the drains as directed by the Engineer using 20,25,50 or 62 mm diameter polyethylene pipes and appropriate fitting.

4.19 CONCRETE KERBS

Precast concrete kerbs, shall comply with the requirements of BS 340 and BS 368 and with the Drawings.

Specially cast radial curves shall be used on curves where the radius is 5m or less.

All kerbs shall be butt jointed and all joints shall be mortared. The quality of concrete, used in kerbs shall be in accordance with relevant sections in this Specification.

Special attention shall be given to the programming of the work so as to avoid clashes and possible removal of installed kerbs.

4.20 TOLERANCE ON LAYING CONCRETE KERBS

Any concrete kerbs deviating in line or level by more than 3mm when tested with a 1 metre straight edge shall be made good by relaying to the satisfaction of the Engineer at the Contractor's own costs.

4.21 CEMENT MORTAR

Mortar shall consist of 1 part cement to 3 parts sand with such minimum quantity of water as is necessary to produce the suitable plasticity for the work for which it is required and shall be used within one hour of mixing.

4.22 CEMENT GROUT

Cement grout shall consist of cement and such minimum quantity of water as is necessary to produce the suitable plasticity for the work for which it is required. It shall be used while fresh and within thirty minutes of mixing.

4.23 LIME MORTAR

Lime mortar shall consist of one part of hydrated lime to two and a half parts of sand, and such quantity of water as is necessary to produce the suitable plasticity for the work for which it is required, and, shall be used within one hour of mixing.

4.24 HYDRATED LIME

Lime for stabilisation shall be Hydrated Calcium Lime (Not Magnesium) and shall generally comply with BS 890, Class B, and with a free lime content of 50 %.

Locally manufactured limes may be accepted by the Engineer in lieu of lime to BS 890 and contractors are advised to ascertain from the Engineer what local limes may be suitable. All percentages of lime specified are based upon hydrated Calcium Limes complying with BS 890 and an adjustment of these percentages may be required for some locally made limes.

The Contractor shall submit with all consignments at his own expense, the manufacturer's data sheets certifying that it complies with BS 890.

4.25 BASALT SAND FOR MORTAR

Sand for mortar shall comply with BS 812 and the grading shall be within the limits specified. Test for purity (ASTM C40) shall be made for each consignment, and at least once a day when sand is used.

4.26 MASONRY WORKS

Stones for masonry works shall consist of sound undecomposed basalt obtained from approved boulders and be of even texture and colour.

The masonry shall be laid to line and in courses roughly levelled up. The bottom courses shall be composed of large selected stones and all courses shall be laid with bearing beds parallel to the natural beds of the material.

Each stone shall be cleaned thoroughly, saturated with water before being set and the bed which is to receive it shall be clean and well moistened. All stones shall be well bedded in freshly made mortar. The mortar joints shall be full and the stones carefully settled in place before the mortar has set.

Wherever possible, the face joints shall be properly pointed before the mortar becomes set. Joint which cannot be so pointed shall be prepared by racking them out to a depth of 5 cm before the mortar has set.

The face surfaces of stones shall not be smeared with the mortar forced in the joints or that used in pointing.

Vertical joints in each course shall break with those adjoining courses at least 15 cm. In no case shall a vertical joint be so located so as to occur directly above or below a header. In case any stone is moved or the joint broken, the stone shall be taken up, the mortar thoroughly cleaned from beds and joints, and the stone is reset in fresh mortar.

Joints not pointed at the time the stone is laid shall be thoroughly wet with clean water and filled with mortar. The mortar shall be well driven into the joints and finished with an approved pointing tool. The wall shall be kept wet while pointing is being done and in hot and dry weather the pointed masonry shall be protected from the sun and kept wet for a period of at least four days after completion. After the pointing is completed and the mortar has set, the walls shall be thoroughly cleaned and left in a neat condition.

4.27 PHOTOGRAPHS

If for the purpose of the works, the contractor has to demolish any wall, fence, gate, shed, post, shrine or planted hedge located in a private property, he shall, as directed by the Engineer, take photographs of the existing structure before proceeding with any demolition work. A copy of each photograph taken shall be submitted to the Engineer.

4.28 LABORATORY TESTS

All tests required for the selection of materials, design of mixes, control of materials and workmanship in order to comply with the requirements of this Specification, may be carried out in a laboratory approved by the Engineer.

The Contractor shall submit with his tender the name of address of the laboratory where he intends to carry out other tests together with the list of tests to be carried out there.

All site tests and sampling shall be carried out by the Contractor's own qualified technicians but the Engineer or his representative shall be allowed at all times free access to and use of the testing facilities.

The Contractor should note that all tests to comply with quality of materials and workmanship are deemed included in the unit price for the works and that no extra claim would be entertained under laboratory tests.

The following laboratory tests shall be carried out by the Contractor for the following in accordance with the procedures given in the relevant standard:

(i) Cement, Concrete and Concrete Aggregates

<i>Description of Test</i>	<i>Relevant Specification</i>
Particle size analysis of aggregate	BS 812
Aggregate crushing value	BS 812
Flakiness	BS 882
Sampling fresh concrete	BS 1881
Slump test of concrete	BS 1881
Concrete cubes	BS 1881

(ii) Soil, Materials for Sub-bases and Bases, and Aggregates for Bituminous Surfacing

<i>Description of Test</i>	<i>Relevant Specification</i>
Liquid Limit	BS 1377
Plastic Limit	BS 1377
Plasticity Index	BS 1377
Linear Shrinkage	BS 1377
Specific gravity of soil	BS 1377
Specific gravity of aggregate	BS 1377
Particle size analysis of soil	BS 1377
Particle size analysis of aggregate	BS 812
Field dry or wet density	BS 1377
Moisture content of soil or Aggregate subject to the Engineer's approval by Speedy Moisture Content to maker's instructions with calibration against Oven-drying method BS 1377 Test 1A	BS 812
Test for slit, clay and impurities of fine aggregate Sedimentation or decantation method (in case of discrepancies the Sedimentation method shall rule)	BS 812
Bulk density of filter in toluene	BS 812
BS Compaction test on soil or aggregate 4.5 Kg hammer	BS 1377

BS Vibrating hammer method test	BS 1377
Aggregate crushing value	BS 812
Los Angeles aggregate abrasion test	BS 812 or ASTM C131,C535
California Bearing Ration (CBR)	BS 1377

One complete analysis shall be made of aggregates or material for aggregates prior to the opening of any borrow pit or the use of any stockpile for at least every 1,000 cubic metre of materials to be used.

(iii) Bituminous Materials

The following tests shall be carried out on each 400 tonnes of mix but at least thrice a day for each mix plant in use.

In addition the extraction of bitumen shall be carried out for each 200 tonnes of mix. In certain circumstances, such as the start of production of a new mix, these frequencies may be increased.

On representative samples taken at the plant: Specification	Relevant
(i) Particle size analysis	BS 812
(ii) Extraction of bitumen	BS 598 : Part 102
(iii) Marshall stability and flow	BS 598, ASTM D1559
(iv) Specific gravity	ASTM D1188 or 2726 as appropriate

(iv) Core Testing

On the compacted pavements, cores 100 mm diameter will be taken using rotary diamond coring drill. On these cores the following tests will be carried out: -
The density to ASTM. D1188 or D2726, as appropriate, and voids content of the compacted mix shall be determined for every 7.00 sq.m. or at least thrice from each day's output.

(v) Bitumen

Before ordering, the Contractor must furnish a test certificate as well as a sample quantity of 4 litres of the bitumen to be tested locally by an approved Laboratory. Every 1,000 tonnes of bitumen on every consignment must be accompanied by a Certificate of Testing from the supplier. The Certificate shall be that of an approved laboratory. If required by the Engineer the following test shall be carried out at an approved laboratory for every 500 tonnes of delivery.

Description of Test Specification	Relevant
1. Penetration Test	AASHO T49
2. Viscosity - Temperature relationship	ASTM D2493
3. Specific gravity	ASTM D70
4. Softening point (Ring and Ball)	ASTM D38

4.29 CONSTRUCTION CONTROL TESTING

All earthworks and layers of pavement construction will be subject to quality control testing and the Contractor must allow in his tender for any disturbance or delays to the sequence of his operations occasioned by such control testing.

The Contractor shall request, in writing, the Engineer's approval for each section of each layer of earthworks and pavement construction. Such requests shall be made only when the Contractor has carried out the necessary tests and is fully satisfied that the section of the work concerned is in condition required by the Specification.

The Engineer shall thereupon without undue delay inspect the section of the Works, analyse the test results submitted and inform the Contractor in writing whether he is accepting or rejecting the section(s) or layer concerned.

Work on layers shall in no circumstances commence until the preceding layers have been approved and accepted by the Engineer in writing. The Contractor is wholly responsible for protecting and maintaining the condition of the work which has been submitted for approval until such time as the required written approval has been given by the Engineer.

Before the last layer of earthworks (the 150 mm of material beneath the top of subgrade) is submitted for approval, all drainage and underground works shall have been substantially completed to the satisfaction of the Engineer.

5 - MISCELLANEOUS ITEMS

5.1 TRAFFIC SIGNS

GENERAL

The sign plates shall be manufactured from Aluminium alloy sheet of at least 3 mm thickness (11 gauge)

The sign plates are to be stiffened and the stiffening may be in the form of a flange at least 15 mm deep on all edges or by means of Aluminium sections.

Material for fixing, such as brackets, sockets, caps, clips, screws, bolts, nuts and washers shall be to the Engineer's approval. Brass or copper will not be allowed for use in contact with Aluminium.

The signs are to be fixed on galvanised posts of 60mm external diameter. The fixing method shall be such that it shall be possible to adjust the direction of the traffic signs at any time on site without having to move the post in its concrete base.

REFLECTIVE SHEETING ON ROAD SIGNS

The reflective sheeting used on road signs shall consist of spherical lens elements embedded with a transparent plastic having a smooth, flat outer surface with a protected pre-coated adhesive which shall be pressure sensitive for manual application or lack free heat activated for mechanical vacuum-heat application.

The reflective sheeting shall be sufficiently flexible so as to permit application over and conformance to a moderate embossed surface. It shall show no damage when bent 90° over a 50 mm diameter mandrill.

The sheeting shall be solvent resistant so as to be capable of withstanding cleaning with petrol, diesel fuel, mineral spirits, turpentine and methanol.

The sheet shall show no cracking or reduction in reflection after being subjected to the dropping of a 25 mm diameter steel ball from a height of 2 meters onto its surface.

The adhesive shall permit the reflective sheeting to adhere securely within 48 hours after application at temperatures of up to 95° C.

The reflective material shall be weather resistant and following cleaning, shall show no definite fading, darkening, cracking, blistering or peeling and not less than 75 of the specified wet or dry minimum brightness values when exposed either to an accelerated weathering period of 12 hours or a natural exposure period of 2 years, in accordance with an approved testing procedure.

The minimum reflective brightness values of the retro-reflective sheeting as compared to Magnesium Oxide (MgO) shall be:

COLOUR	ANGLE OF INCIDENCE	ANGLE OF DIVERGENCE	REFLECTIVE VALUE COMPARED WITH MgO
Red	-4°	0.5°	15
	20°	0.5°	10
	50°	0.5°	3
White	4°	0.5°	75
	20°	0.5°	70
	50°	0.5°	70
Yellow	-4°	0.5°	45
	20°	0.5°	35
	50°	0.5°	10
Blue	-4°	0.5°	6
	20°	0.5°	4.5
	50°	0.5°	0.5

The brightness of the reflective sheeting when totally wet by rain, shall be not less than 90% of the values.

COLOURS FOR ROAD SIGNS

Standard colours to be used for signs, posts and fittings shall be as described in the relevant BS as follows:-

Red	BS 381C No. 537
Blue	BS 4800 No. 0.013
Grey for post fittings and back signs	BS 2660 No. 9-101
Black and White	B.S 873 CB & 3C

RUST INHIBITIVE PRIMING PAINT

Rust inhibitive paint shall comply with BS 2523: Lead Based Priming Paints.

5.2 ROAD MARKING WITH PAINT

The paint to be used for road surface marking shall be specifically manufactured for such purpose. It shall be suitable for applying by brush, low pressure spraying equipment and high pressure spraying equipment to give a chemically stable film of uniform thickness. It shall be either chlorinated rubber and shall be stored and applied in accordance with the manufacturer's instructions. Unless otherwise agreed by the Engineer, paint shall be

applied without the use of thinners or other additives. The paint shall not "no lead paint" when tested as per BS 3900: Part B3.

Lines and letters shall be painted on the road on locations shown on the Drawings or ordered by the Engineer. The setting out of lines shall be made by the Contractor and shall be to the Engineer's approval. Works and symbols shall be set out by the Contractor according to Drawings provided by means of stencils.

COLOUR

(i) White

The colour of white markings shall when laid be approximately to BS colour No. 102 of BS 381C. The pigment used shall be titanium dioxide type A Anatase or type R (Rutile) complying with BS 239.

(ii) Yellow

The colour of yellow markings shall when laid be approximately to BS colour No. 355 of BS 38/C

CHLORINATED RUBBER PAINTS

The chlorinated rubber paints used for the permanent road markings shall comply with the following:

- (i) Maximum % by weight of chlorinated rubber – 20%
- (ii) Maximum % by volume of pigment at 20° C :- 50%
- (iii) Minimum colouring (prime) pigment content % by weight :-

White paint	16%
Yellow paint	10%

(iv) Surface drying time determined in accordance with BS 6044:- less than 5 minutes.

(v) Hard drying time determined in accordance with BS 6044, Appendix D: - less than 15 minutes at 23° C.

(vi) Adhesion to concrete or bituminous surfaces must, in the opinion of the Engineer, be good.

Prior to application of paints or thermoplastic, the road surface to be marked shall be thoroughly cleaned of all loose material and shall be completely grease-free and dry. Where ordered by the Engineer, the prime coat shall be used to increase adhesion. The spraying rate for cold paint will vary with the roughness of the surface, but shall be such as to give continuous coverage and at minimum wet film thickness of 400 microns provide a dried film of low sheen. The paint shall provide a suitable binding media for reflectorisation. Immediately after application of the cold paint, glass spheres shall be spread on top at a rate of approximately 0.65 kg per litre of paint; unless otherwise specified.

5.3 HOT-MELT THERMOPLASTIC

The Thermoplastic Material shall be to BS3262 : part 1:1987 with the following characteristics:-

Softening Point :-	Not less than 65°
Luminance Factor:-	Not less than 50%
Heat Stability:-	Not less than 45%
Flow Resistance:-	Not less than 25%
Skid Resistance:-	Not less than 45
Binder Content:-	Between 18.0 % and 22.0 %
Solid Glass Bead Content:-	20%
Combined Minimum Aggregate, pigment, extender and solid glass bead content:-	Between 78% and 82%

The grading of combined aggregate, pigment, extender and solid glass bead must be within the following limits:-

B.S Sieves	Limits
2.80 mm	100
600 micron	65-95

The minimum thickness of the thermoplastic layer shall be 1.5 mm.

5.4 CAT'S EYES

The Contractor shall take delivery from the stores of the Road Development Authority or from any other place of omni-directional, bi or uni directional reflectors to be fixed on site as directed by the Engineer.

5.5 FELLING OF TREES

Bushes, trees and roots shall be cut down, grubbed up or otherwise removed in a manner to be directed by the Engineer. Trees, defined as having a girth of 1 metre and over, measured one metre from the ground, shall be taken down in stages, the higher branches being first sawn or loped off then the corresponding position of the trunk shall be sawn off and the sequence repeated. Holes left by the removal of roots shall be backfilled and compacted to 90% B.S. Heavy Compaction with approved material up to the existing ground level or up to the top of the sub- grade level if the area is to be excavated, whichever is the lesser. The Contractor must seek the approval of the Forestry Department prior to the removal of any tree.

5.6 RAISING OF MAN-HOLES/DRAINS

All works shall be done in the presence or with the authorisation of the Authority concerned (CWA, CEB, MT, WWA) and following strictly their methodology and specifications.

5.7 GUARD-RAILS

Guard Rails supplied by the Contractor shall be accompanied by a Certificate from the manufacturer stating that the materials supplied to conform to the following:-

The steel posts shall conform to the requirements of AASHTO M183 and galvanising shall be in accordance with AASHTO M111. The guard rails shall be galvanised, corrugated sheet steel beams conforming to the requirements of AASHTO M180-778

Class A, with a base metal nominal thickness of 2.67 mm and Type 1, with zinc coated of 550 g/m² minimum spot and of W-Beam shape.

Guard rail shall be erected at the location designated by the Engineer. The engineer shall approve the depth and size of holes prior to the fixing of the posts. Posts shall be spaced as shown in the drawings and shall be set plumb and to the established lines and grades. End sections shall be anchored to the ground by means of RCC post as indicated in the Drawings or by the Engineer. The guard rail as installed and finished shall not deviate in the horizontal direction and in levels from the specified lines and grades by more than 5 mm.

5.8 HAND-RAILS AND METAL GRATINGS

Nuts and bolts not designated as high strength shall conform to the requirements of ASTM A307 and steel tubing shall conform to the requirements of ASTM A500, Grade B. Anchor bolts, nuts and all steel portions of railings and gratings shall be galvanised. Galvanising shall conform to the requirements of AASHTO M111(ASTM A123) and galvanising of nuts and bolts shall conform to the requirements of AASHTO M232 (ASTM A153). Minor abrasions to galvanised surfaces shall be repaired with zinc rich paint.

All exposed welds shall be finished by grinding or filling to give a smooth surface.

Metal railings shall be carefully adjusted prior to fixing in place to the approval of the Engineer. After fixing of hand-rails or metal gratings, all sharp protrusions shall be removed and the railing or grating cleaned of discolouring foreign materials

5.8 WORKS ORDERS

LIST OF DRAWINGS

Drawing. No. 1	CONCRETE KERBS& FOOTPATH
Drawing. No. 2	RETAINING WALLS

PART 3 – Conditions of Contract and Contract Forms

Section VI. General Conditions of Contract

The General Conditions of Contract (GCC) applicable for this procurement is available on the web site of the Procurement Policy Office ppo.govmu.org under Reference No. W/GCC 10/05-14 dated 06 May 2014

The GCC can be used for both admeasurement contracts and lump sum contracts

Section VII. Particular Conditions of Contract

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

A. General	
GCC 1.1 (r)	The Employer is <i>The Chief Executive, The District Council of Savanne, Lady Barkly Street, Souillac</i>
GCC 1.1 (v)	The Intended Completion Date for the whole of the Works shall be: <i>As per Works Order issued.</i>
GCC 1.1 (y)	The Project Manager is: <i>The Ag. Head, Public Infrastructure Department of The District Council of Savanne, Lady Barkly Street, Souillac</i>
GCC 1.1 (aa)	The Sites shall be located within <i>Jurisdiction of The District of Savanne</i>
GCC 1.1 (dd)	The Start Date <i>shall be:</i> <i>Within 7 days from signature of contract</i> <i>For all other works orders: As specified in the works order</i>
GCC 1.1 (hh)	The Works consist of <i>the Construction of Roads with Retaining Walls within the Jurisdiction of The District of Savanne</i>
GCC 2.2	Sectional Completions are: as mentioned in works orders
GCC 2.3(i)	The following documents also form part of the Contract: (i) Insurance Covers (ii) Performance security (iii) Addendum or Corrigendum (if any)
GCC 3.1	The language of the contract is English
GCC 5.1	The Project manager <i>may</i> delegate any of his duties and responsibilities.
GCC 8.1	N/A
GCC 13.1	<ul style="list-style-type: none"> a) for the Works, Plant and Materials: Rs10.0M or equivalent to the total amount of works done, whichever is greater (b) for loss or damage to Equipment: Rs5.0M (c) for loss or damage to property: Rs2.0M (d) for personal injury or death: <ul style="list-style-type: none"> (i) of the Contractor's employees: Rs2.0 Million (ii) of other people: Rs2.0 Million [This cover shall be for Third Party extended to the Employer and its representatives]. (e) for loss or damage to materials on-site and for which

	<p>payment have been included in the Interim Payment Certificate, where applicable: NOT APPLICABLE</p> <p>The Contractor shall choose to take the insurance covers indicated above as separate covers or a combination of the Contractor's All Risks coupled with the Employer's liability and First Loss Burglary, after approval of the Employer. All insurance covers shall be of nil or the minimum possible deductibles at sole expense of the contractor.</p>
GCC 14.1	Site Data are: There are no site investigation reports for this project.
GCC 20.1	<p>The Site Possession Date shall be:</p> <p><i>Within 7 days from signature of contract</i></p> <p><i>For all other works orders: As specified in the works order</i></p>
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: <i>No Adjudicator shall be appointed for this Contract.</i>
GCC 24.	<p>In case a dispute of any kind arises between the Employer and the Contractor in connection with, or arising out of, the contract or the execution of works or after completion of works and whether before or after repudiation or other termination of Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of the Employer's Representative, the matter in dispute shall, in the first place, be referred in writing to the employer's representative, with a copy to the other party.</p> <p>The Employer and the Contractor shall make every effort to resolve the dispute amicably by direct informal negotiation. If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Public Body or the Contractor may give notice to the other party of its intention to refer the matter to the competent courts of Mauritius"</p>
GCC 24.3	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: <i>Not applicable.</i>
GCC 24.4	<i>Not Applicable</i>
B. Time Control	
GCC 25.1	The Contractor shall submit for approval a Program for the Works within <i>7 days from the date of issue of works order.</i>
GCC 25.3	The period between Program updates is <i>15 days.</i>
C. Quality Control	
GCC 33.1	The Defects Liability Period is: <i>365 Days</i>
GCC 39.7	Interim Payment for Plant and Material on site is <i>Not Applicable.</i>

D. Cost Control	
GCC 41.1 (l)	The term exceptionally adverse weather conditions is hereby defined as any one of the following events: <i>(1) 30mm rainfall or above recorded in 24 hours at the nearest rain station;</i> <i>(2) An official declaration of torrential rain by the Mauritius Meteorological Services; and</i> <i>(3) Cyclone warning class III or above.</i>
GCC 43.1	The currency of the Employer's country is: <i>Mauritian Rupees.</i>
GCC 44.1	The Contract is not subject to price adjustment in accordance with GCC Clause 44.
GCC 45.1	The proportion of payments retained is: <i>10% of the value of works. Upon completion of the works, 50% of the retention would be released. The other 50% would be released after the defects liability period.</i>
GCC 46.1	The liquidated damages for the Works are <u><i>Rs10,000/- per day per site where works have been delayed.</i></u> The maximum amount of liquidated damages for the Works is <u><i>10% of the value of works done or Rs 50,000, whichever is greater, per site where works have been delayed.</i></u>
GCC 47.1	Not Applicable
GCC 48.1	Advance Payment shall not be applicable for this contract.
GCC 49.1	The Standard Form of Performance Security acceptable to the Public Body shall be "a Bank Guarantee". <u><i>The Bank guarantee shall be 10% of the value of each works order, inclusive of provisional and contingencies sum and VAT.</i></u>
E. Finishing the Contract	
GCC 55.1	The date by which operating and maintenance manuals are required is <i>Not Applicable.</i> The date by which "as built" drawings are required is <i>Not Applicable.</i>
GCC 55.2	The amount to be withheld for failing to produce "as built" drawings and/or operating and maintenance manuals by the date required in GCC 58.1 is <i>Not Applicable.</i>
GCC 57.2 (g)	The maximum number of days is: <i>to be determined as per each works order</i>
GCC 59.1	The percentage to apply to the value of the work not completed, representing the Employer's additional cost for completing the Works, is <i>10%.</i>

Section VIII - Contract Forms

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

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Letter of Acceptance

[on letterhead paper of the Employer]

..... *[date]*

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

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

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

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

Authorized Signature:

Name and Title of Signatory:

Name of Agency:

Attachment: Contract Agreement

Contract Agreement

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

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

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) the Letter of Acceptance
 - (b) the Bid
 - (c) the Addenda Nos *[insert addenda numbers if any]*.
 - (d) the Appendix to the General Conditions of Contract
 - (e) the General Conditions of Contract;
 - (f) the Specification
 - (g) the Drawings; and
 - (h) the completed Schedules,
3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

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

Signed by: _____
for and on behalf of the Employer

Signed by: _____
for and on behalf the Contractor

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

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 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).....

Sample Form of Preference Security

**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*]⁹, 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 _____

⁹ Amount to be inserted by the Guarantor in accordance with Sub-Clause 49.2 of the General Conditions of Contract

Advance Payment Security

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

Beneficiary: *[Name and Address of Employer]*

Date:

Advance Payment Guarantee No.:

We have been informed that *[name of the Contractor]*. (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]*.) 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.”