

THE DISTRICT COUNCIL OF BLACK RIVER

BID DOCUMENT

FOR

UPGRADING OF DRAIN AT LA GAULETTE

**Procurement Reference No:
ONB/DCBR/W08/2019-2020**

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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 Rs 500 000 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 specialization **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

- 7.1 The Bidding Document consists of all the Sections indicated below, and should be read in conjunction with any Addenda

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.

- Document** issued in accordance with ITB 10.
- Section I - Instructions to Bidders (ITB)
 Section II- Bidding Data Sheet
 Section III - Bidding Forms
 Section IV - Evaluation Criteria
 Section V - Employer's Requirements
 Section VI – General Conditions of Contract
 Section VII- Particular Conditions of Contract
 Section VIII - Contract Forms
- 7.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.
- 8. Clarification of Bidding Document**
- 8.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address **indicated in the BDS**.
- The Employer will respond in writing to any request for clarification, provided that such request is received 15 days prior to the deadline for submission of bids.
- Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 10.
- 9. Site visit/Pre-bid meeting**
- 9.1 Bidders, at the Bidders' own responsibility and risk, are encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing their Bids and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidders' own expense.
- 9.2 The Bidder or its designated representative is invited to attend a pre-bid meeting, as **provided for in the BDS**. The purpose of the pre-bid meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- Non-attendance at the pre-bid meeting will not be a cause for Disqualification of a bidder.
- 10. Amendment of Bidding 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,

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."

dating and rewriting.

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

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

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

17. Currencies of Bid and Payment

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

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

18. Documents Comprising the Technical Proposal

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

19. Period of Validity of Bids

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

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

20. Bid Security/Bid Securing Declaration

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

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

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

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

as non-responsive.

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

21. Format and Signing of Bid

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

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

D. Submission and Opening of Bids

22. Sealing and Marking of Bids

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

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

22.2 The inner and outer envelopes shall:

- (a) bear the name and address of the Bidder;
- (b) be addressed to the Employer as indicated in ITB 22.1;
- (c) bear the specific identification of this bidding process indicated in accordance with ITB 1.1; and
- (d) bear a warning not to open before the time and date for bid opening.

23. Deadline for Submission of Bids

23.1 Bids shall be delivered to the Employer at the address and no later than the time and date **specified in the BDS**.

The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in

accordance with ITB 10.

- 24. Late Bids** 24.1 Late bids shall not be considered. They will be returned unopened
- 25. Withdrawal, Substitution, and Modification of Bids** 25.1 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid submission Form or any extension thereof.
- 26. Bid Opening** 26.1 The Employer shall open the bids at the time place and address **specified in the BDS** in the presence of Bidders' designated representatives who choose to attend.
- 26.2 The bidders' names, the Bid Prices, the total amount of each bid, any discounts, any alternative bid, bid modifications and withdrawals, the presence or absence of bid security, and such other details as the Employer may consider appropriate, will be announced and recorded by the Employer at the opening.

E. Evaluation and Comparison of Bids

- 27. Confidentiality** 27.1 Information relating to the examination, evaluation, comparison, and post-qualification of bids and recommendation of contract award, shall not be disclosed to Bidders or any other person not officially concerned with such process.
- 27.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.
- 28. Clarification of Bids** 28.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its bid. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 31.
- 29. Determination of Responsiveness** 29.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in ITB13.
- 29.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission.
- 29.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 18, Technical Proposal, in particular, to confirm that all requirements of Section IV

(Employer's Requirements) have been met without any material deviation, reservation or omission.

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

30. Nonconformities, Errors, and Omissions

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

31. Correction of 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: THE DISTRICT COUNCIL OF BLACK RIVER</p> <p>The Works consist of the UPGRADING OF DRAIN AT LA GAULETTE</p> <p>The name and identification of the Contract are ONB/DCBR/W08/2019-2020</p>
ITB 1.2	The Intended Completion period is: <u>180 days from the next day of handing over of site</u>
ITB 2.1	The Funding Agency is: THE DISTRICT COUNCIL OF BLACK RIVER
ITB 3.2	<p>(a) The address to file Challenges in respect of this procurement is:</p> <p style="text-align: center;">The Chief Executive, District Council of Black River Geoffroy Road, Bambous</p> <p>(b) The address to file Application for Review is:</p> <p style="text-align: center;">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: none
ITB 6.2 ©	Contractors should have at least 5 years of experience in Civil Engineering Works
ITB 6.2 (g)	The assessment of the financial soundness of the company shall be on a pass/fail basis on its overall performance including its profitability.
ITB 6.3 (b)	<p>A1) The Contractor shall demonstrate that it is registered with the CIDB under the following class: Civil Engineering Construction works and specialization in the following area(s) Construction of Drains and Related works</p> <p>(A2) The Contractor shall also demonstrate that it meets experience as prime contractor in the Construction of Drains and Related works of a minimum of 2 works of a nature and complexity equivalent to the Works over a period of 3 years</p>
ITB 6.3	The essential equipment to be made available for the Contract by the successful Bidder shall be: VIBRATING ROLLER 8-10T, VIBRATING ROLLER 1.5-2T, DUMPERS, LORRIES/TIPPER LORRIES, EXCAVATOR LOADER, WATER PUMP, BITUMEN

(c)	<p>SPRAYER, ASPHALT CUTTER ,TRANSPORTATION VEHICLES AND ANY OTHER EQUIPMENT REQUIRED FOR THE PROPER EXECUTION OF THE CONTRACT.</p> <p>Particulars as to whether the equipment is owned or on hire have to be specified.</p>
<p>ITB 6.3 (d)</p>	<p>QUALIFICATIONS OF KEY PERSONEL</p> <p>Project Manager: A Civil Engineer registered with the Council of Registered Professional Engineers’ of Mauritius having at least 5years post registration experience.</p> <p>Technical Officer: A Diploma in Building & Civil Engineering having at least 5 years experience in Asphalt works/Civil works</p> <p>Foreman: 10 years experience dealing with Asphalt / civil or related works</p>
<p>ITB 6.3 (e)</p>	<p>The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be Rs 3 million.</p> <p>The Bidder should submit documentary evidence mentioning the name of this project and its Procurement Reference. Non-submission of the supporting document may lead to rejection of the bids.</p> <p>Documentary evidence may comprise but not limited to:-</p> <ol style="list-style-type: none"> (1) Bank Certificate (2) Certificate from Auditors (3) Certificate from a Professional Registered Accountant
<p>B. Bidding Documents</p>	
<p>ITB 8.1</p>	<p>The Public Body’s address for clarification is:</p> <p>Head Public Infrastructure Department, District Council of Black River, Geoffroy Road, Bambous.</p>
<p>ITB 9.2</p>	<p>A pre-bid meeting has been scheduled for <u>Wednesday 20 November 2019 at 11.00 hours at La Gaulette</u></p>
<p>C. Preparation of Bids</p>	
<p>ITB 13.1 (f)</p>	<p>Any additional materials required to be completed and submitted by the Bidders are none</p>
<p>ITB 17.1</p>	<p>The Contract is not subject to price adjustment in accordance with GCC Clause 44.</p>
<p>ITB 17.2</p>	<p>Interim Payment for Plant and Material on site is not applicable.</p>
<p>ITB 19.1</p>	<p>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, ie <u>05 March 2020</u></p>
<p>ITB 20.1</p>	<p>No Bid Security is required.</p>

	Bid shall include a subscription to a Bid Securing Declaration
D. Submission of Bids	
ITB 23.1	The deadline for submission of bids shall be <u>Friday 06 December 2019 up to 12.00 hours (Local Time) at latest.</u>
	The Employer's address for the purpose of Bid submission is Attention: The Chief Executive Officer, District Council of Black River, Geoffroy Road, Bambous
E. Evaluation and Comparison of Bids	
ITB 26.1	The bid opening shall take place at: <u>Council Room 1st Floor, the District Council of Black River, Geoffroy Road, Bambous on Friday 6 December 2019 at 12h30</u> The bidders' representatives who are present shall sign a register evidencing their attendance.
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 percentage(s) of preference allocated to those in group A. 32.2 Bidders applying for the Margin of Preference shall submit, as part of their bidding documents evidence of: <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

	<p>the annual turn-over of the local Small and Medium enterprise (where applicable) does not exceed Rs 50M.</p> <p>(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></p>
F. Award of Contract	
ITB 40.1	The Standard Form of Performance Security acceptable to the Public Body shall be “a Bank Guarantee”. The Bank guarantee shall be 10% of the contract price inclusive of provisional and contingencies sum and VAT.
ITB 41	The Advance Payment shall be limited to <i>[insert percentage]</i> percent of the Contract Price less the provisional and contingencies sums: Not Applicable
ITB 42.1	Interim Payment for Plant and Material on site is not applicable.

Section III - Bidding Forms

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Bid Submission Form

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

Note: All italicized text is for use in preparing these form 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 rates are as given in **Bill of Quantities - Price Activity Schedule -Schedule of Rates;**
- (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 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.

- (m) 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;
- (n) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and
- (o) If awarded the contract, the person named below shall act as Contractor's Representative:
-

⁶ Use one of the two options as appropriate.

Name:

In the capacity of:

Signed:

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

Date:

Seal of Company

Appendix to Bid Submission Form

Bid Securing Declaration

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

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

- (a) have modified or withdrawn my/our* Bid after the deadline for submission of bids during the period of bid validity specified by the Bidder in the Letter of Bid; or
- (b) have refused to accept a correction of an error appearing on the face of the Bid; or
- (c) having been notified of the acceptance of our Bid by the (*insert name of public body*) during the period of bid validity, (i) have failed or refused to execute the Contract, if required, or (ii) have failed or refused to furnish the Performance Security, in accordance with the Instructions to Bidders.

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

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

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 Rs 500 000 are duly registered with the CIDB in accordance with CIDB Act 2016.]

1.6 Financial reports for the last *[insert number; usually 3]* years: Financial Statements, Audited Accounts, etc. *[List below and attach copies.]*⁷

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.

⁸*In lump sum contracts, the "Bill of Quantities" is prepared for information; it is not contractual. The contractual document prepared by the Bidder shall be a "Schedule of Activities."*

- 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 Quantities⁸

Objectives

The objectives of the Bill of Quantities are:

1. (a) to provide sufficient information on the quantities of Works to be performed to enable bids to be prepared efficiently and accurately; and
2. (b) When a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and contents of the Bill of Quantities should be as simple and brief as possible.

Dayworks Schedule

A Dayworks Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Public Body of the realism of rates quoted by the bidders, the Dayworks Schedule should normally comprise the following:

1. (a) A list of the various classes of labor, materials, and Constructional Plant for which basic day work rates or prices are to be inserted by the Bidder, together with a statement of the conditions under which the Contractor shall be paid for work executed on a day work basis.
2. (b) Nominal quantities for each item of day work, to be priced by each Bidder at day work rates as Bid. The rate to be entered by the Bidder against each basic day work item should include the Contractor's profit, overheads, supervision, and other charges.

Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary priced Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Particular Conditions of Contract should state the manner in which they shall be used, and under whose authority (usually the Employer's Representative).

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors (refer to GCC Clause 8) should be indicated in the relevant

⁸*In lump sum contracts, the "Bill of Quantities" is prepared for information; it is not contractual. The contractual document prepared by the Bidder shall be a "Schedule of Activities."*

part of the Bill of Quantities as a particular provisional sum with an appropriate brief

⁹In lump sum contracts, the “Bill of Quantities” is prepared for information; it is not contractual. The contractual document prepared by the Bidder shall be a “Schedule of Activities.”

Section III- Bidding Forms 31

PRICED ACTIVITY SCHEDULE

Complete the unit prices (rate) for each item listed below. Authorise the prices quoted in the signature block below.

Schedule of Rates

ITEM NO.	BRIEF DESCRIPTION OF WORKS	Quantity	Unit of Measure	Unit Price (Rs)	Total Price (Rs)
A	UPGRADING AND CONSTRUCTION OF DRAIN NEAR RAGOO FAMILY (SITE 1)				
1.	Demolition of exiting masonry drain and construction of new Reinforced Concrete drain as per drawings and specifications along stretch A-B (approx. 15m Length) Refer to DWG/W/001, DWG/W/002, and DWG/W/003.		SUM		
2.	Demolition of exiting masonry drain, exiting boundary wall and construction of new Reinforced concrete drain and new boundary wall along stretch B-C as per drawings and specifications (approx. Length 15m). Refer to DWG/W/001, DWG/W/002, and DWG/W/004.		SUM		
3.	Construction of reinforced concrete drain along stretch C-D as per drawings and specifications, (approx. Length 40 m). Refer to DWG/W/001, DWG/W/002, and DWG/W/005.		SUM		
4.	Demolition of part of existing masonry drain and construction of L-Shape Drain as per drawings and Specifications. Refer to DWG/W/001, DWG/W/002, and DWG/W/006.	m	13		

B	UPGRADING AND CONSTRUCTION OF DRAIN AT AVENUE DES PALMIERS (SITE 2)				
1.	Demolition of exiting masonry drain , Concrete Platform and construction of a new Reinforced Concrete drain along Avenue Des Palmiers Road as per drawings and specifications (Drain Type 1) Refer to DWG/W/001, DWG/W/007, and DWG/W/008. Note: Guard Stone to be fixed at every 2.0 m intervals as per drawings and Specifications along wall of drain. (Rate to include Painting of Guard Stone – (Black & Wide)	10	m		
2.	Demolition of exiting masonry drain, Concrete Platform and construction of a new Reinforced Concrete drain along Avenue Des Palmiers Road as per drawings and specifications (Drain Type 2). Note: Guard Stone to be fixed at every 2.0 m intervals as per drawings and Specifications along wall of drain. (Rate to include Painting of Guard Stone – (Black & Wide) Refer to DWG/W/001, DWG/W/007, and DWG/W/009.	165	m		
3.	Construction of Reinforced Concrete Cross Drain 500mm x 500mm – 900mm along Avenue Des Palmiers Road as per drawings and specifications. (6 No. Cross Drain). Refer to DWG/W/001, DWG/W/007, and DWG/W/010.	75	m		
4.	Construction of Reinforced Concrete Slabsfor Vehicular access as per drawings and specifications at entrance of exiting dwelling premises physically present on site along Avenue des Palmiers. Note: (3 Nos. Entrance). Refer to DWG/W/001, DWG/W/007, and DWG/W/012.	30	No		

	Approx. Dimensions (4m x 1.5m x 0.2m), (1.5m x 12mx 0.2)& (1.5m x 13m x 0.2)				
5.	Supply and fixing of Galvanised metal grating Heavy Duty as per drawing and specifications. Refer to DWG/W/001, DWG/W/007, and DWG/W/010.	3.9	m ²		
PROVISIONAL (SITE 3)					
1.	Construction of Masonry Wall and Concrete lining floor along natural water course at Avenue Des Frangipanes as per drawings and Specifications. Refer to DWG/W/001, DWG/W/011.			SUM	
2.	Construction of L-Shape R.C Wall as per drawings and Specification. Approx. 8m Length. Refer to DWG/W/001, DWG/W/011.			SUM	

	SUB-TOTAL	
	15% VAT	
	SUB-TOTAL INCLUSIVE OF VAT	
	CONTIGENCIES	150,000.00
	TOTAL AMOUNT	

Form of Bid Security (Bank Guarantee)

.....*Bank's Name and Address of issuing Branch or Office*.....

Beneficiary: *Name and Address of Public Body*.....

Date:

BID GUARANTEE No.:

We have been informed that*name of the Bidder*..... (Hereinafter called "the Bidder") has submitted to you its bid dated..... (Hereinafter called "the Bid") for the execution of*name of contract* under Invitation for Bids No.....*IFB number* ("The IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid security.

At the request of the Bidder, 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*.....) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has modified or withdrawn its Bid after the deadline for submission of its bid during the period of bid validity specified by the Bidder in the Form of Bid; or
- (b) has refused to accept a correction of an error appearing on the face of the Bid; or
- (c) having been notified of the acceptance of its Bid by the Public Body during the period of bid validity, (i) has failed or refused to sign the contract Form, if required, or (ii) has failed or refused to furnish the performance security, in accordance with the Instructions to Bidders.

This guarantee shall expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) thirty days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before*Public Body to insert date*.....

.....*Bank's seal and authorized signature(s)*.....

PART 2 – Employer’s Requirements

Section V - Employer's Requirements

Table of Contents

1. Specifications

2. Drawings

3. Supplementary Information

Specifications and Performance Requirements

UPGRADING OF DRAIN AT LA GAULETTE NEAR RAGOO FAMILY (SITE 1)

- (1) The work consists of :
 - i. Demolition of an existing masonry drain along stretch A-B, of approximate length 15m.
 - ii. Demolition of an existing masonry drain and a boundary wall along stretch B-C of approximate Length 15m.
 - iii. Carting away of demolition debris / excavated materials to an approved site by the Project Engineer and cleaning of site after demolition works.
 - iv. Compaction of the excavated trenches to the required formation levels using appropriate compaction equipment and construction of reinforced concrete drains along stretches A-B , B-C and C-D including reconstruction of the boundary wall to the existing heights and specifications.
 - v. Demolition and reconstruction of approximately 13m of masonry drain floor and one sided wall as detailed in drawings.

Note: Excavation works to be in any materials including rock to required lines and levels. Any Damages caused to existing road structure and nearby building infrastructure shall be reinstated by the Contractor at his own cost.

- (2) Construction of Reinforced Concrete Drain shall be as per drawings and Specifications DWG/W/003, DWG/W004, DWG/W/005 and DWG/W/006.
- (3) The existing boundary wall shall be reinstated to back original conditions including rendering works and painting works.
- (4) Existing Upvcdrainage pipes at Rear Face of Ragoo Family Building to be extended through the RC Drain Wall. Contractor to supply and fix Upvc pipes and fittings.

UBGRADING OF DRAIN AT LA GAULETTE, RUES DES PALMIERS (SITE 2)

- (1) The work consists of demolition of existing masonry wall, concrete platform and construction reinforced concrete drain and reinforced concrete access slabs for vehicular access as per drawings and specifications. DWG/W/007, DWG/W/008, DWG/W/009 and DWG/W/010, DWG/W/013.
- (2) Carting away of demolition debris / excavated materials to an approved site by the Project Engineer and cleaning of site after demolition works.
- (3) Compaction of the excavated trenches to the required formation levels using appropriate compaction equipment and construction of reinforced concrete drains.

Note: Excavation works to be in any materials including rock to required lines and levels. Any Damages caused to existing road structure and nearby building infrastructure shall be reinstated by the Contractor at his own cost.

- (5) After getting approval of the excavation works and compacted surface bed, water shall not penetrate the excavated trench width so as not to disturb the prepared compacted surface bed.
- (6) The blinding layer shall be of concrete grade 15 (C15) to the specified thickness as per drawings.
- (4) Supply on site all necessary plant and materials.
- (5) Making and erecting formwork, supply, cutting and placing of concrete.
- (6) Supply and placing of concrete bed, mortar jointing, etc.
- (7) Supply and placing of expansion joint and water stops, all details shall be supplied by Contractor and approved by Engineer.
- (8) The contractor shall provide temporary access for pedestrian and vehicular access using steel plates or any approved methodology of works with respect health and safety guidelines.
- (9) Where the stream is flowing, a temporary diversion shall be done to allow the water to continue its flow during the construction.
- (10) Striking off formwork,.Flow test and flushing of drains,backfill and making good/re-instatement the sides of the constructed drains as directed by the Engineer.
- (11) Manufacture, supply, transport and fix hot dipped galvanized Metal Grating (after manufactured) metal grating, U- bar frame as per drawing;

**CONSTRUCTION OF R.CWALL AT AVENUE DES FRANGIPANES,
CONSTRUCTION OF MASONRY WALL AND R.C. FLOOR LINING (SITE 3)**

- (1) The works consist of construction of a Reinforced concrete wall as per drawings and specifications. Concrete grade to be C30. The works are more fully explained on the drawing sheet DWG/W/011.
- (2) Provision of regular stones and Construction of masonry wall and concrete lining floor along 16m stretch of natural watercourse. Excavation in any type of materials, supply, and cutting ad placing sound rocks for masonry works to lines and levels. Cavity filling with concrete class 20 between the stones. Building in pipes and forming small openings or weep holes as directed by the Project Engineer.

Mixing of cement mortar and concrete.

The works are more fully explained on drawing sheet DWG/W/011.

Note: Total Approx. Length of Masonry Wall (Both Sides) 16m x 2 (32m)

- (3) NOTE: This part of the Project will be Provisional depending on funds available at time of implementations.

GENERAL SCOPE OF WORKS AND SPECIFICATIONS

- (1) Within 7 (Seven) days after the signature of contract and prior to any commencement of work , the Contractor shall submit to the Project Engineer a detailed methodology of work comprising of the followings documents I). Method of works, ii) Programme of works, iii). Erection Methodology, IV). Health & Safety Measures, v). Equipment to be used for the upgrading works.
- (2) Notification plates to be affixed as per drawings before starting the project to inform the public and same to remain until completion of the project.
- (3) The contractor shall provide labour, tools, equipment and scaffolding for the works. The contractor shall also supply and place/fix all the materials, fittings/accessories, etc for the works. All necessary utilities (electricity, water, etc....) to be provided/borne by the contractor.
- (4) All works will only commence upon approval of previously completed works at every stage of the project.
- (5) Safety precautions are to be adhered to by ensuring that all plants are operated by authorized operators during the demolition activity.
- (6) The contractor shall be responsible for the full and proper setting out of works where required.
- (7) Where the stream is flowing, a temporary diversion shall be done to allow the water to continue its flow during the construction.
- (8) After excavation, the surface bed shall be prepared to the required levels as per construction drawings and compacted by mechanical means to the satisfaction of the Project Engineer or Engineer's Representative.
- (9) After getting approval of the excavation works and compacted surface bed, water shall not penetrate the excavated trench width so as not to disturb the prepared compacted surface bed.
- (10) The blinding layer shall be of concrete grade 15 (C15) to the specified thickness as per drawings.
- (11) Reinforcement shall be laid and fixed as per drawings and technical specifications.

(12) Upon approval of the reinforcement, formworks shall be firmly fixed to the satisfaction of the Project Engineer or Engineer's Representative ensuring that 25mm cover is satisfied throughout the base slab, side walls.

(13) Supply and lay concrete grade 30 (C30) inclusive of curing compound as per technical specifications. 3 cube tests shall be tested by an approved registered public/para-public laboratory on 7days and 28 days each respectively. Contractor should ensure appropriate measures to prevent cement grout at joints and at construction joints.

Note: All concrete to be cast together and benching surface finish done before concrete has set. Additional Screed or concrete will not be accepted.

(14) Curing with curing compound immediately after concrete has set after casting. Curing compound to be applied strictly to manufacturer's specifications and instructions.

Contractor to submit Curing Compound Specifications for approval.

Note: No pouring of concrete is acceptable during weekend/public holidays and without approval from the Project Engineer or Engineer's Representative.

(15) The contractor shall remedy any damages caused during the construction works, clear the site and cart away all redundant materials to the satisfaction of the Project Engineer.

Note: Any damaged caused to the Road structure and nearby infrastructure shall be reinstated by the contractor at his own cost.

(16) The contractor shall:

- i) Keep the site clean and safe at all times;
- ii) Comply with all safety, health, and environment provisions in this contract if any ; and
- iii) Comply with all laws relating to safety, health, and the environment.

(17) Completion time is inclusive of provisional items in the price activity schedule. Should provisional items not be awarded, the completion time shall remain unchanged.

Note: Any damaged caused to the Road structure and drain shall be borne by the contractor.

SPECIFICATION 1: EXCAVATION AND EARTHWORKS

1.1) Site Clearance

If and where required the Site shall be cleared of all trees, shrubs and other vegetation, buildings and other obstructions, hard surfacing and rubbish. Other parts of the Site shall be cleared to the extent indicated on the Drawings or instructed by the Engineer.

No trees or bushes are to be cut without the prior approval of the Forestry Department. The Employer shall be responsible to seek the necessary approval. The cutting of trees and bushes by the Contractor shall be done under the supervision of the officers of the Forestry Department who shall have to be notified at least 48 hours before starting this work. All trees and bushes cut shall become the property of the Forestry Department and shall have to be stacked in an orderly manner by the Contractor and as directed by the officers of the Forestry Department adjacent to the main road so that they can be easily loaded on lorries by the Forestry Department.

Trees, shrubs, hedges, walls, buildings and other items which are to be preserved as indicated on the Drawings or instructed by the Engineer shall be protected from injury or damage arising from the operations of the Contractor, his subcontractors and other persons under his control and from any other injury or damage which is the responsibility of the Contractor under the Contract.

Within areas to be occupied by buildings, roads, hard standings or other Permanent Works, and where bulk excavation is not required, stumps of trees and shrubs shall be completely removed. Roots having a diameter greater than 20 mm shall be removed to at least 0.5 meter below formation level or original ground level whichever is the lower.

Where underground structures, manholes, wells and similar items are discovered, their presence shall be reported immediately to the Engineer and they shall not be further disturbed until the Engineer has given his instructions for their disposal.

Where such underground structures, manholes, wells and similar items are demolished and removed from areas which are to be occupied by buildings, roads, hard standings and other Permanent Works, any holes or depressions resulting from such removal shall be filled with material similar to that in the surrounding ground and compacted to a density equal to that of the surrounding ground unless other treatment is shown on the Drawings or instructed by the Engineer.

Combustible material arising from site clearance shall not be burnt on Site without the written consent of the Engineer. Non – combustible material and material which the Engineer does not permit to be burnt on Site shall be disposed of as spoil. The consent of the Engineer to the burning of material on Site shall not relieve the Contractor of his responsibilities under the Contract.

All removable items which are to be preserved in accordance with the Drawings, the Specification or the instructions of the Engineer shall be stored on Site in a place of safety and in a manner appropriate to their nature. All such items shall remain the property of the Employer.

1.2) Diversion of Existing Drains and Services

The Contractor will be required to excavate trial pits to locate and expose existing services along the alignment of the drains as instructed.

Construction of the drains per se shall not commence until all services along the route have been identified and, if necessary realigned. All realignment or diversion work shall be carried out with the approval of the concerned authorities. (CEB, CWA, Telecoms etc.)

The Contractor shall remove or divert drains and services as shown on the Drawings or as located on site as instructed by the Engineer. Each diversion shall be complete before the original drain or service is cut and shall be connected into the original line with the least possible interruption to its operation.

Drains and services that are to be removed shall be cut and stopped off at points instructed by the Engineer in a manner acceptable to the Engineer. Such cutting and stopping off shall only be carried out upon receipt of a written notification from the Engineer.

The Contractor shall maintain the flow in all ditches, channels and other surface waterways at all times including times during which diversions are being carried out. Where such diversions are temporary, the Contractor shall reinstate both the original ditch, channel or other waterway and the site of the temporary diversion in a manner acceptable to the Engineer.

1.3) Control of Water in Excavations and Earthworks

Unless otherwise required or permitted by the Contract, excavation and earthworks shall be carried out in the dry. The Contractor shall at all times maintain control of water entering excavations from any source.

Water shall not be allowed to flow across or down any excavated surface that is liable to erode. Water emerging on to excavated surfaces shall be trapped and led away by suitable means before any Permanent Works are placed on or against such surfaces.

The Contractor shall provide enough sumps to deal with all flows encountered and shall by pumping or otherwise keep the water level in such sumps at least 0.5 metre below the lowest excavated surface for as long as may be required for the purpose of constructing the Permanent Works.

The Contractor shall repair to the approval of the Engineer any foundations damaged by water.

No water shall be allowed to flow on to earth fill and the surface of such fill shall at all times be maintained at a gradient adequate to shed rainwater. Formations or soil structures that deteriorate under rainfall shall either be covered to prevent damage by rainfall or left high or trimmed immediately before being concreted.

1.4) General Requirements for Excavation and Earthworks

(a) Constructional Plant

Before any Constructional Plant for excavation and earthworks is ordered or delivered to Site, the Contractor shall submit to the Engineer full details of the Plant he proposes to use and the arrangements he proposes to make.

Ground Levels

Before any excavation or earthworks is commenced, the site of the excavation or earthworks shall be surveyed by the Engineer. Drawings recording the survey and indicating the levels and gradients to which the drains are to be constructed shall be issued by the Engineer. These shall be checked by the Contractor prior to construction and any discrepancies pointed out before construction commences.

Such records shall not be altered in any way unless such alterations are agreed and signed by both the Contractor and the Engineer.

(c) Excavated Surfaces

All excavated surfaces shall be finished neatly to the lines and levels shown on the Drawings unless such lines and levels are shown as nominal.

When such lines and levels are stated to be nominal, the final lines and levels will be instructed by the Engineer to take into account the conditions of the ground exposed as the excavation nears the nominal lines and levels shown on the Drawings and the Contractor may be required to carry out the excavation in more than one stage in order to arrive at the final lines and levels.

Excavated surfaces which will remain permanently exposed on completion of the Permanent Works shall be cleared of a" loose material, pieces of rock, debris, rubbish and the like and left neat and tidy.

(d) Supports to Excavations

The responsibility of the Contractor for the safety and care of the Works under the Contract shall include taking the following measures:

- (i) The Contractor shall excavate the sides of excavations that are not positively supported to slopes that will remain stable;

- (ii) The sides of excavations that are not cut to a stable slope shall be properly and adequately supported to the extent necessary to ensure stability during the period of construction of the Permanent Works and the excavation shall then be backfilled unless otherwise indicated on the Drawings;
- (iii) No materials, plant or other load shall be placed so close to any excavation that the stability of the sides of the excavation is endangered; and
- (iv) The Contractor shall remove or otherwise secure by barriers, net or other means any material that might fall and thereby cause damage to the Permanent Works or injury to any person.

The Contractor shall be responsible for the installation and subsequent removal of all necessary sheeting, timbering, strutting, shoring and the like to secure the excavations, to prevent any movement of adjacent ground and to ensure the safety of workmen and freedom from damage to structures, buildings, streets, sewers, drains, walls, services or any other thing.

Where temporary underpinning is required, the Contractor shall submit to the Engineer full details of the design, materials to be used and method of working proposed.

(e) Slips and Over-excavation

The Contractor shall avoid excavating beyond the lines and levels shown on the Drawings, disturbing ground adjacent to excavations, or damaging material beyond the limits of the required excavation except to provide the minimum adequate working space.

Slippages, excavation for working space, over-excavation and damaged areas shall be made good to the satisfaction of the Engineer. In the case of surfaces on which or against which Permanent Works are to be constructed, this remedial work shall comprise replacing the slipped, over-excavated or damaged material with suitable filling material or with concrete as instructed by the Engineer. No additional payment will be made for over break.

Slips, falls, subsidence and other damage which have the effect of removing or reducing support to existing or proposed structures, services and the like shall be made good in concrete or otherwise in a manner acceptable to the Engineer.

In the case of permanently exposed surfaces, remedial work shall comprise replacing and compacting material similar to that, which has been removed in order to provide a surface not less satisfactory than adjacent correctly excavated surfaces. If this is not possible, remedial works shall be as instructed by the Engineer.

(f) Records of Excavation

After completion of each section of Permanent Works excavation, the Contractor shall provide the Engineer with a record of the excavation. The record shall comprise all relevant information including the following:

- (1) the location of the excavation;
- (2) the elevation of the original ground and of any groundwater which is encountered during the excavation;
- (3) the measures taken to deal with groundwater;
- (4) the elevation, thickness and classification of all strata encountered; and
- (5) The instructed and actual levels of excavation.

1.5) Trenches for Storm water Pipe and Box Culverts

When excavation is being carried out in trenches, pits and similar confined areas, the sides of the excavation shall be properly shored or close sheeted and the Contractor shall follow the appropriate recommendations in BS 6031 - Code of Practice for Earthworks.

Trenches for pipe culverts shall be excavated as to allow the pipes to be properly laid to line and level, jointed, inspected and tested. The width of all trenches from the bottom of the trench to the crown of the pipe shall be no wider than is necessary/ to permit the correct jointing of the pipes laid in the trench, but in no case shall the clearance between the outside of the barrel of such pipes and the face of the excavation or trench supports be less than 150 mm.

Trenches for pipe culverts shall be excavated below the invert level of the pipe to a depth that will allow the minimum thickness of granular bedding material or concrete as shown on the Drawings to be placed. The bedding material shall be hard clean stone which has been approved by the Engineer and which passes a 10 mm BS sieve but is retained on a 2.36 mm sieve and shall extend across the full width of the trench. Concrete beds shall also extend across the full width of the trench.

If precast or in-situ box culverts are laid then the excavation shall be net.

1.6) Disposal of Excavated Material

Unless areas within the Site have been designated in the Contract or agreed by the Engineer as spoil areas, all spoil shall be disposed of in areas to be found by the Contractor outside the Site.

All spoil tips shall be formed with side slopes which will remain stable under all conditions to which they will be subject and the tops shall be graded to prevent the ponding of water. When tipping of spoil has been completed, spoil tips shall be trimmed and graded to present a neat and tidy appearance.

Temporary stockpiles of material for later use in the Works shall be formed with side slopes which will remain stable under all conditions to which they will be subject and the tops shall be graded to prevent the ponding of water.

Different materials shall be placed in separate spoil tips or stockpiles unless otherwise agreed by the Engineer.

Spoil tips and stockpiles shall be placed so that there is no risk of material obstructing or polluting watercourses.

1.7) Backfilling

Excavations that are to be backfilled and any other fill areas shown on the Drawings shall be filled with suitable material from the excavations unless otherwise directed. If insufficient material is available from this source, the Contractor shall supply suitable material from another source.

All vegetation, topsoil, rubbish and unsuitable material shall be removed from any area on which fill is to be placed unless the Engineer agrees otherwise.

Except where special placing and compacting requirements are laid down in the Specification, the material shall be placed in layers not exceeding 300 mm after compaction, and compacted to not less than 90% of its maximum dry density measured as in Test No. 12 of BS 1377 - Determination of the dry density/moisture content relationship (2.5 kg rammer).

When placing fill, the Contractor shall make due allowance for settlement and shall ensure that the final lines and levels are as shown on the Drawings. Any areas that subside shall be made good without delay, up to the end of the Defects Liability period.

1.8) Cover Slabs

The cover slabs shall be built in precast reinforced concrete to the dimensions given in the Drawings or as directed by the Engineer. They shall be constructed with Class 30 concrete and shall in all respects comply with the requirements for precast concrete. Alternatively under road traffic, if so directed, they may be built with precast concrete formers and an in - situ reinforced concrete topping layer in modules 5m long.

The precast slabs shall be fixed in place to the lines and levels directed by the Engineer on a smoothly prepared level surface so that no rocking occurs. The top surface shall be given an anti-skid texture by bush hammering or by any other method approved by the Engineer.

1.9) Soakaways

Soakaways shall be constructed to the lines and levels as specified by the Engineer.

These soakaway drains shall be constructed in accordance with the drawings to the approval of the Engineer. Unless otherwise instructed by the Engineer, the final level of the roof slabs or gratings shall be slightly lower than the existing ground level or existing wearing course if applicable.

All other clauses in this specification for excavation, geotextile, grating and concrete covers will equally apply to soakaways. Stone filling shall be of sound, durable rock obtained from approved quarries or stockpiles of boulders.

1.10) Reinforced Concrete Stormwater Culverts

Where instructed by the Engineer, the Contractor will supply and lay from an approved supplier, suitable reinforced concrete stormwater pipes or precast box culverts. RC stormwater pipes shall have gasket type spigot and socket joints and shall comply with BS 5911: Part 3: 1982. "Precast Concrete Pipes and Fittings for Drainage and Sewerage. Box culverts will be cast with suitable interlocking male and female end sections.

Exterior jointing of culverts will be carried out using a 1:3 cement mortar mix in accordance with the manufacturer's recommendations.

1.11) Preparation of Trenches

The Contractor shall give the Engineer at least 20 hours' notice of his intention to lay bedding material or culverts. No bedding material shall be placed until the Engineer has approved the trench bottom. Any soft areas in the trench bottom shall be dug out and replaced by granular bedding material or concrete as instructed by the Engineer.

When culverts are required to have a concrete bedding or surround, the trench shall first be blinded with concrete having a minimum thickness of 50 mm, laid at such a depth that the thickness of concrete shown on the Drawings can be placed.

1.12) Laying Culverts in Trenches

Immediately before culverts are placed in any trench, the bottom shall be cleared of all stones and other debris and shall be in a condition acceptable to the Engineer.

Prior to placing in the trench, all culverts shall be inspected for damage. Damaged culverts that in the opinion of the Engineer cannot satisfactorily be made good shall not be used in the Permanent Works.

End caps or discs placed on pipe culverts for protection during transit shall not be removed until immediately before the pipes are jointed.

Culverts shall be firmly bedded throughout their length to the required alignment and level so that they are concentric at each joint. All pipes shall be suitably wedged, shored or otherwise restrained to prevent movement during testing and backfilling but such restraints shall not be left in place permanently unless so instructed or agreed by the Engineer.

Pipe culverts which are to receive a concrete bed and haunch or surround shall be set on suitable concrete blocks or bricks with a pad of hessian based damp proof course two millimetres thick interposed between the pipe and the block. Setting blocks shall not be used with other forms of bedding.

1.13) Backfilling Trenches

After successful completion of air testing on each length of culvert backfill shall be placed as below:

(i) Culverts laid on granular bedding.

Granular bedding material shall be placed and compacted carefully on both sides of the culvert up to 300mm above the crown. Care shall be taken to ensure that no voids are left under the culvert. The remainder of the trench shall be filled with excavated material from which all stones larger than 75mm and all lumps of clay larger than 75mm have been removed. Backfill material shall be compacted in 150mm thick layers. The first 300mm of excavated material shall be compacted by hand and the remainder of the trench shall be compacted using a vibrating plate compactor or a mechanical rammer. The trench shall be finished flush with the surrounding ground surface;

(ii) Culverts with concrete bedding or surround.

When the concrete bedding or surround has been placed where instructed the trench shall be backfilled with excavated material as described in (i) above. The backfilling shall not be commenced until the concrete is 7 days old. Where material excavated from trenches is unsuitable for use as backfilling the Contractor shall import suitable material.

Surface reinstatement to trenches for culverts shall be to the original condition unless the original surface was DBST or asphaltic concrete sealed in which case reinstatement shall be 150mm crusher run and 50mm of asphaltic concrete wearing course on minor roads. If the culvert is to be laid under a higher category road a total thickness of 400mm of crusher run with an additional 100mm thickness of asphaltic concrete base course will be required.

SPECIFICATION 2: ASPHALT CONCRETE

2.0) Bitumen

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

- | | |
|--------------------------|----------------------|
| (a) Straight Run Bitumen | ASTM D946 |
| (b) Cut-Back Bitumen | ASTM D2027 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 Project Manager from time to time that the bitumen and bitumen products being used are in accordance with these Specification. 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.

2.1) Prime Coat

The surface of the road base shall be, if required by the Project Manager, 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 Primer – ECI 50 applied at a rate of approximately 1.2 litres/sqm where bituminous concrete is to be laid. The rate of application may be varied by the Project Manager 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 and 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 Project Manager. Where the prime coat does not completely penetrate into the base, the excess should be blotted with sand or single sized aggregate 4/6 at the rate of 6litre/m². The prime shall be completely cured before spreading asphalt concrete or placing surface treatment.

The prime coat may only be applied after the Project Manager 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 Project Manager 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 Project Manager all in accordance with Sub-section 3.3 and at the Contractor's expense.

2.11) 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 Project Manager 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 at the rate of 0.400 to 0.600 lt/m² of SK 40.

2.12) 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 Project Manager.

2.13) Aggregate for Asphalt Concrete

Classes of Aggregates

Aggregates for bituminous course shall be obtained by mixing 3 or more classes' dmm/Dmm of materials defined for each class, by the maximum size (Dmm) and minimum size (dmm) of particles.

Dimensions D and d will be chosen in the following series of sieve sizes: 2 - 6.3 - 10 - 14- 20.

Crusher run 0/20 may be used for the production of bituminous course provided that all the required specifications are satisfied.

Before the Works are started, the Contractor shall submit to the Project Manager's approval the gradation curve of reference for material of each class.

The gradation curve of reference for each class shall satisfy the following requirements: -

- Percentage by weight of material retained by sieve Dmm: not more than 10%
- All material shall pass sieve 1,25Dmm
- Percentage by weight of material passing sieve dmm: not more than 10 %
- All material shall be retained by sieve 0,63dmm
- 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 gradation curve of reference for each class of material such as proposed by the Contractor at the commencement of the Works shall not exceed the following values.

SIEVES (MM)	CLASSES						
	0/2	0/4	2/6,3	4/6,3	6,3/10	10/4	6,3/14
0,08	+ - 4	+ - 3					
0,20	+ - 6	+ - 4					
0,63	+ - 7	+ - 5					
1,25	+ - 7	+ - 6	0				
2,00	-10	+ - 6	+10				
2,50	0	+ - 6	+ - 6	0			
4,00		-10	+ - 7	+10			
5,00		0	-10	+ - 8	0		0
6,30			0	-10	+10		+10
8,00				0	+ - 12	0	+ - 8
10,00					-15	+10	+ - 8
12,50					0	+ - 12	+ - 8
14,00						-15	-15
18,00						0	0

According to the characteristics of the crusher plant, the Contractor may be allowed to submit for the Project Manager's approval production of classes 0/3 instead of 0/2.

Coral sand shall not be used.

Crushed basalt sand shall be used.

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	-100	91-99
12.5	90-100	75-91
10	80-90	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 Project Manager to replace all or part of the aggregate smaller than 2.35 mm B.S. test sieve.

Rounded sands may be permitted to replace up to half the aggregate smaller than 2.36 mm with the approval of the Project Manager.

2.14) 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 Project Manager once the design mix has been approved.

2.15) 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 toluene shall not be less than 0.5 g/ml and not more than 0.9 g/ml as measured in accordance with BS 812.

2.16) Bituminous Binder

The bitumen binder for bituminous concrete shall be straight run bitumen penetration grade 40/50. The bitumen for the different penetration grades, when tested in accordance with BS 598, AASHTO T164 or ASTM D2172 method, shall conform to the following requirements.

	Penetration Grade		
	40/50	60/70	80/100
Penetration at 25 ⁰ C 100g 5sec (0.1mm) (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 D113, AASHTO T51)	600	800	1000
Loss on heating 1630C 5hrs			
(i) % Loss	<1	<1	<2
(ii) Retained penetration	>70	>70	>70

2.17) Absorptive Aggregate

Where aggregates have a 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.

2.18) Preparation of Design Mix

The Contractor shall carry out trial mixes to determine the job mix formulae (gradation of aggregates, precise proportions of bitumen and aggregates) at least 30 days before production of bituminous mixes are started and as soon as possible after commencement of aggregate production.

The study shall permit to check that, in spite of the normal fluctuations of a well adjusted plant, the performances of the materials satisfy the requirement of these Technical Specifications.

The Contractor shall submit for the approval of the Project Manager full details of his proposed aggregates grading and bitumen content together with details of the mix design and results of test carried out at ranges of bitumen contents from below the proposed bituminous content to above. Specimens at each bitumen content shall be made in quadruplicate.

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. A trial stretch not exceeding 50 m by 3.5 m by the contractor at a location approved by the engineer at the start of the contract.

2.19) Mix Requirements

The working mixes for base and wearing courses shall comply with the following requirements from the Marshall Stability test ASTM D1559, AASHTO T245 based on 75 blows compacted specimens:

	Base Course/ Reshaping	Wearing Course
Marshall Stability at 60°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

2.20) Working Mix

When the Job Standard Mix is approved by the Project Manager, 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 \pm 4% by mass of total mix.
- Aggregate passing 5 mm B.S. Sieve but retained on 75 micron B.S. Sieve: Design mix \pm 3% by mass of total mix.

-
- Aggregate passing 75 micron B.S. Sieve: Design mix $\pm 1.5\%$ by mass of total mix.

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

2.21) 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 Project Manager. 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 Project Manager. 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 130°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 contact. When laying bituminous on gradients steeper than 4% the paver shall be operated in an up-hill direction.

2.22) Compaction

The layers shall be compacted while the mixed materials temperature is within 130 C to 115 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 Project Manager, but shall in no case below 105°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 Project Manager. The wearing course shall be given a finishing roll with a 12 T three wheeled steel roller. Care shall be taken in the selection and use of rollers so as not to overcompact the layers.

2.23) 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 Project Manager.

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.

2.24) 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.

2.25) 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 3.0 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 3.0 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 Project Manager, by more than ± 6 mm.

2.26) 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.

2.27) 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.

2.28) 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 Project Manager and appropriate and sufficient artificial lighting is provided. Hauling over freshly laid material will not be permitted.

2.29) Protection

After final rolling no vehicular traffic of any kind shall be permitted on the surfacing for at least 4 hours or such longer times as may be ordered by the Project Manager. No rollers or other plant shall be left standing on completed work.

2.30) Asphalt thickness

The Contractor shall obtain confirmation and approval from the Project Manager 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.

2.31) 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:-

	CUT BACK RC250 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 items of road furniture shall be protected.

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

10/12 ton self-propelledtyred roller shall be exclusively used. They shall make 3 to 5 passes, subject to approval of the Project Manager.

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

The rates shall be checked every day 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%.

2.24) Cracks Sealing

The prime shall consist of an “inverted emulsion” prime manufactured from a base bitumen of 80/100-penetration grade. An MSP/1 prime or equivalent shall be used.

2.24.1) Emulsion for cold applied sealant

The emulsion for the crack treatment shall consist of an Anionic Stable Grade Emulsion or Cationic Spray Grade Emulsion. When blended on site, “Revertex” or other rubber latex emulsion shall be added to the bitumen emulsion to give 8% net rubber on net bitumen content. If a proprietary brand blend is used, the constituents shall conform to the manufacturer’s specification.

2.24.2 Blowing out cracks

The Contractor must provide a mobile compressor capable of discharging 3m³/min compressed air at 750kPa pressure. The compressed air shall be free of deleterious matter that may adversely affect the bond between the sealant and the cracks. The compressor shall be free of oil and diesel leaks.

A lance shall be used to direct the force of the air into the cracks and must be maneuverable enough to follow the path of the crack accurately.

If hot air is specified, the compressed air must be heated by a hot air lance capable of achieving a temperature of 300°C in the combustion chamber.

2.24.3 Prime injectors

A special prime injector for injecting prime into open cracks using compressed air propulsion shall be manufactured. Essentially the equipment shall consist of a blowpipe with nozzle to direct the jet of compressed air into the cracks, a venturi or similar device shall be fitted to the blow pipe for sucking in prime from the storage vessel. A suitable throttling valve shall be fitted on the prime supply line to adjust the prime flow, i.e. to adjust the compressed air to prime ratio. The blow pipe shall be of approximately 20mm diameter steel tubing, threaded at the open end so that suitable bitumen spray nozzles can be fitted. The other end shall have a suitable coupling to connect to the compressor, complete with a shut-off valve to isolate the injector from the compressed air source.

The injectors, blowpipes, storage vessel interconnecting piping, etc, shall all be capable of safely withstanding the pressure generated by the compressors. Design sketches of the equipment shall be submitted to the Project Manager for approval.

2.24.4 Sealant

The sealant shall be applied through an applicator manufactured specifically for this purpose. Essentially the equipment for the hot sealant shall consist of a mobile vessel capable of heating the sealant to the required application temperature by indirect heat, controlled by a thermostat to prevent overheating. A calibrated thermometer shall be fitted in an accessible position to accurately measure the sealant temperature in the tank. Special pumps, which can deliver the sealant to the crack in a controlled fashion, shall be used.

Proprietary brand seals shall be applied as specified by the suppliers.

SPECIFICATION: 3 CEMENT CONCRETE

3.1) Materials

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

3.1.1) 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 Project Manager, all at the Contractor's expense.

All bagged cement shall be stored in a waterproof shed on a wooden floor raised at least 150 mm 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 Project Manager is first obtained.

3.1.2) 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 Project Manager. 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	40
for 20mm aggregates	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

3.1.3 Fine Aggregate

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

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 Project Manager.

3.1.4 Coarse Aggregate

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				
	63 mm	38 mm	20 mm	12 mm	9.5 mm
75 mm	100				
63 mm	85 - 100	100			
37.5	0 - 30	85 - 100	100		
20 mm		0 - 20	85 - 100	100	
14 mm				85 - 100	100
10 mm		0 - 5	0 - 20	0 - 45	85 - 100
5 mm			0 - 5	0 - 10	0 - 20
2.36 mm			0 - 2	0 - 2	0 - 5

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

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

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 BS Sieve

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

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.

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.

3.1.5 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 Project Manager 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.

3.2 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.

3.3 Standard Mixes

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.

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 Project Manager, 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 Project Manager, shall be used. The volume of the gauge boxes shall take into account the bulking of the aggregates.

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 tp 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 20 mm for all mix classes except for class 15(40) where 40 mm 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.

3.4 Mixing Water

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

3.5 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 Project Manager, and due allowance for the water present in them shall be made when determining the amount of water to be added at the mixer.

3.6 Mixing on Site

Unless otherwise authorised by the Project Manager, 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 Project Manager.

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.

3.7 Ready Mix Concrete

Ready mixed concrete, as defined in BS 5328 and batched off the site may only be used with the approval of the Project Manager 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 Project Manager, 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 Project Manager.

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 Project Manager. The maximum volume of mixed concrete transported in an agitator shall be in accordance with the specified rating.

3.8 Handling and Placing

3.8.1 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 Project Manager has approved the formwork and reinforcement. The Contractor shall give at least 24 hours' notice to the Project Manager of the times he proposes to concrete and the Project Manager 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 Project Manager is priorily obtained.

3.8.2 Handling

Concrete shall be transported in watertight containers in such as 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 Project Manager 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.

3.8.3 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 Project Manager. 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 300 mm 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.

3.9 Compaction

Concrete, during and immediately after 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 Project Manager or as provided herein.
- ii) Vibrators shall be of a type and design approved by the Project Manager. 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 450 mm to 600 mm.
- 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.

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- 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 uniformly 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.

3.10 Protection and Curing

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.

Curing Compound should be of Acrylic Resin Based white pigmented to substantially increase light reflectance to effectively prevent premature water loss from the concrete both due to heat of hydration and sunlight.

All curing methods to be used shall be subject to the approval of the Project Manager. 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.

3.11 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 6 mm measured from a 3 m 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.

3.12 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 Project Manager's discretion. The frequency and number of tests required by the Project Manager for any concrete subsequently used in the Works will be at the discretion of the Project Manager, 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.

3.13 Loading Concrete Structures

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

3.14 Faulty Concrete

Any concrete which, in the opinion of the Project Manager, 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 Project Manager and at the Contractor's expense. The contractor may submit to the Project Manager details of his proposals for rectifying the defects and shall comply with the Project Manager's instructions regarding the method of carrying out the work. Notwithstanding the Project Manager's approval, should the remedial work prove again unsatisfactory, the Contractor shall further make good all defective and rejected work at his own expense.

3.15 Precast Concrete

3.15.1 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 Project Manager to supervise the working on the yard all to the satisfaction of the Project Manager. 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.

3.15.2 Concrete Grades

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

3.15.3 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 Project Manager. Before casting is commenced the Contractor shall submit, for the approval of the Project Manager 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.

3.15.4 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.

3.15.5 Surface Finishes Generally

The methods used for compacting the concrete must be such that pinholes or air holes 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 discolored, may be rejected at the Project Manager's discretion. Where carrying out of remedial work is approved by the Project Manager, 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 Project Manager. Any units which are rejected shall be disposed of away from the Site at the Contractor's expense.

3.15.6 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 Project Manager 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 Project Manager, 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 Project Manager, 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 fenders of timber or other approved material during the lifting, handling and erection stages.

3.15.7 Stacking of Precast Units

Where members are stored, they shall be firmly supported at such bearing positions that will ensure that the 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.

3.15.8 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.

3.16 Formworks

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

3.17 Steel Reinforcements

All reinforcing steels shall conform to MS 10. The Contractor shall, when called upon by the Project Manager, 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 Project Manager, the Contractor shall submit a test certificate of the rolling. The Contractor shall when requested by the Project Manager, 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 Project Manager, 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 Project Manager.

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 Project Manager has inspected the reinforcement and has given permission to place concrete.

3.18 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 Project Manager using 20, 25, 50 or 62 mm diameter polyethylene pipes and appropriate fitting.

3.19 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 5 m 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 the Specification.

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

3.20 Tolerance on laying concrete kerbs

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

3.21 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.

3.22 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.

3.23 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.

3.24 Hydrated Lime

Lime for stabilization 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 Project Manager in lieu of lime to BS 890 and Contractors are advised to ascertain from the Project Manager 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.

3.25 Basalt Sand for Mortar

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

3.26 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 for pointing 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.

SPECIFICATION 4: SAFETY AND HEALTH

4.1 Introduction

This part has been formulated for contractors to carry out work assigned by the District Council of Black River in accordance with safety and health standards.

Contractors must strictly adhere to Occupational Safety & Health Act 2005 and all relevant safety legislation. They are responsible to ensure so far as reasonably practicable, that the sites under their control are safe & without risks to safety & health for their employees and any other persons who may be affected by the work processes. Where a Main Contractor has recourse several sub-contractors, it will be the responsibility of the main contractor for overall supervision of safety & health. The main contractor and subcontractors are directly responsible for the safety of their own employees. They will also be responsible to take up extra duties towards other persons and vehicles passing next to the sites or on the roads where they are carrying works.

4.2 Guidelines

Notwithstanding any other part of the contract, the contractor shall adhere to the following guidelines. These guidelines address the main areas of concern pertaining to safety & health at work and shall in no circumstances alleviate the contractor from other safety & health obligations under OSHA 05 or any other legislation.

4.2.1. The contractor is responsible for providing protection for pedestrians and vehicles in accordance with all applicable codes and standards.

All temporary roads and safety signs shall be of approved ones and shall be of quality construction, clearly visible and legible, properly placed and secured at relevant points.

4.2.2. Health & Safety management

It is to be noted that the contractor is responsible for the safety of onsite operations. The contractor must, throughout the progress of the works comply with his duties under the OSHA 2005 and all other relevant legislations.

The contractor shall have a clear safety & health plan and shall ensure that this plan is effectively implemented on all sites under his control.

This applies to all construction activities regardless of size or value.

4.2.3. Inspection of worksite

The contractor shall provide regular inspections of the worksite by competent, professional health and safety personnel. Records of such inspections shall be maintained by the contractor. A monthly safety & health report should be sent to the Project Manager/Supervisor.

4.2.4. Protection of Personnel

4.2.4.1 Risk Assessment

The objective of risk assessment is to identify project related hazards and develop methods to deal with those hazards.

All risk assessments shall be reviewed and revised as necessary to accommodate any change in methods of working, plant, equipment, material and/or site development.

Copies of each risk assessment shall be made available to the District Council of Black River representative for information.

4.2.4.2 Accidents and emergencies

The contractor shall provide sufficient first aiders and adequate measures for the first aid facilities as may be required.

Any work accident or dangerous occurrence including property damage shall also be reported to the Project Engineer/Engineer Representatives as soon as possible.

All serious or potentially serious accidents/incidents are to be thoroughly investigated by the main contractor and written records produced indicating remedial actions. The contractor shall forward a copy of all work related accident reports to the district council of Black River.

4.2.4.3 Personal Protective Equipment (PPE)

The contractor shall select PPE appropriate to the work hazards identified. Adequate arrangements are to be made for the storage, cleaning, maintenance and replacement of PPE. The contractor must take all reasonably practicable steps to ensure that all PPE are used correctly by the relevant persons. This will require the provision of information, instruction and training to staff.

The contractor shall make arrangements for providing any visitor with appropriate protective equipment/clothing for the purpose any visit to be effected on the site of work should the need arise.

4.2.4.4 Welfare facilities

The contractor shall provide and maintain as required by the contract such adequate accommodation for messing and toilets, and allow full use of such accommodation to all persons employed on site by himself and the subcontractors under his responsibility.

4.2.4.5 Potable water

Contractors shall make arrangements for potable water supply to all persons employed or visiting the site of work.

4.2.5. Plant & Equipment

- 6.2.5.1 Contractors general plant and equipment
- 6.2.5.2 Electrical equipment
- 6.2.5.3 Cranes, hoists, air receivers etc.

4.2.5.1 Contractors plant and equipment

All equipment provided shall be suitable for the use for which it is intended. The contractor shall ensure that site plant and equipment is inspected and thoroughly examined at regular intervals by competent persons and maintains all records of such inspection/examinations in a register.

4.2.5.2 Electrical Equipment

Electrical installations provided on site are to comply with the requirements of the Electricity at Work Regulations or the latest edition of the IEE Wiring regulations.

The contractor shall ensure that all tools and distribution equipment including cables, plugs, etc. are complete and examined for signs of damage or wear prior to use. Worn or damaged equipment shall not be used.

4.2.5.3 Cranes, lifting machines, air receivers etc.

The contractor shall ensure that all lifting machines, air receivers, air compressors comply with existing regulations. A current copy of the examination certificates shall be kept on site and made available for information upon the request of the District Council of Black River Safety & Health Officer.

Each item of lifting equipment shall be marked with its safe working load which shall not be exceeded and also with its unique identification marks.

Any equipment showing signs of wear or damage to safety critical parts shall be taken out of service immediately.

(A) PERFORMANCE REQUIREMENT

- a) When the works have been completed, the contractor shall submit to the Project Engineer or Engineer's Representative a completion certificate which signifies inspection have been made to ensure that all works are completed and that the project have been done according to specification, drawings and contract documents.

THE DRAWINGS

PART 3 – Conditions of Contract and Contract Forms

Section VI. General Conditions of Contract

The General Conditions of Contract (GCC) applicable for this procurement is available on the web site of the Procurement Policy Office ppo.govmu.org under Ref. No. **W/SBD28/05-17 dated 09th May 2017** and **W/GCC10/05-14 dated 06th May 2017**

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

Section VII. Particular Conditions of Contract

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

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

A. General	
GCC 1.1 (r)	The Employer is The District Council of Black River Chief Executive, Geoffroy Road, Bambous
GCC 1.1 (v)	The Intended Completion Date for the whole of the Works shall be <u>within 150 days from date of handing over of site</u>
GCC 1.1 (y)	The Project Manager is <i>The Head, Public Infrastructure Department,</i> <i>The District Council of Black River</i>
GCC 1.1 (aa)	The Site is located at La Gaulette
GCC 1.1 (dd)	“The Start Date shall be within 7 days after handing over of site. Possession of site shall be within 7 days from the date of signature of site
GCC 1.1 (hh)	The Works consist of Upgrading of drains at La Gaulette
GCC 2.2	Sectional Completions are: NOT APPLICABLE
GCC 2.3(i)	The following documents also form part of the Contract: Scope of works Performance Security Insurance Policies Addendum (if any) The Contract Agreement The Letter of Acceptance The Letter from the Bidder The Bid Submission Form The General Conditions of Contract The Particular Conditions of Contract The Employer’s Requirements Filled Priced Activity Schedule

	Specifications The Bidder's Qualifications
GCC 3.1	The language of the contract is English The law that applies to the Contract is the law of Mauritius.
GCC 5.1	The Project manager <i>may</i> delegate any of his duties and responsibilities.
GCC 13.1	<p>Except for the cover mentioned in (d)(i) hereunder, the other insurance covers shall be in the joint names of the Contractor and the Employer and the minimum insurance amounts shall be:</p> <p>(a) for the Works, Plant and Materials: (<i>for the full amount of the works including removal of debris, professional fee etc...</i>) Rs 7.5 M</p> <p>(b) for loss or damage to Equipment: (<i>for the replacement value of the equipment that the contractor intends to use on site until the taking over by the Employer.</i>) Rs 5.0 M</p> <p>(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract <i>for an amount representing the value of the properties that are exposed to the action of the contractor in the execution of the works. It will extend to the property of the Procuring Entity as well</i>). Rs 5.0 M</p> <p>(d) for personal injury or death:</p> <p>(i) of the Contractor's employees: [<i>The Contractor shall take an adequate insurance cover for its employees for any claim arising in the execution of the works</i>]. Rs 5.0 M</p> <p>(ii) of other people: [<i>This cover shall be for an adequate amount for Third Party extended to the Employer and its representatives</i>]. Rs 5.0 M</p> <p>(e) for loss or damage to materials on-site and for which 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: No site data is available
GCC 20.1	The Site Possession Date(s) shall be: As defined in Works Orders
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: No Adjudicator shall be appointed for this Contract.

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:</p> <p>commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.</p>
GCC 24.3	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: Not applicable.
GCC 24.4	Not applicable
B. Time Control	
GCC 25.1	The Contractor shall submit a Program of Works within 7 days from the date of the Works Orders.
GCC 25.3	<p>The period between Program updates is 15 days.</p> <p>The amount to be withheld for late submission of an updated Program is NOT APPLICABLE.</p>
C. Quality Control	
GCC 33.1	The Defects Liability Period is: 365 days.
GCC 39.1	“Payment shall be made as per progress of works without payment for materials on site”.
GCC 39.7	Interim Payment for Plant and Material on site is not applicable.
D. Cost Control	
GCC 41.1 (l)	<i>The term “exceptional adverse weather conditions” is hereby defined as any one of the following events:</i>

	<p><i>(i) Above 20 mm of rainfall recorded in day at the nearest rain station.</i></p> <p><i>(ii) An Official declaration of “Torrential Rain” by the Meteorological Department of Mauritius and</i></p> <p><i>(iii) Cyclone warning class 3 or above.</i></p>
GCC 43.1	The currency of the Employer’s country is: Mauritian Rupees.
GCC 44.1	The Contract <i>is not</i> subject to price adjustment in accordance with GCC Clause 44.
GCC 45.1	The proportion of payments retained is: 10% which shall be retained from any payment. Half of the retention money will be released after formal taking over of the Works and the remaining shall be released after the Defects Liability Period subject to the Contractor making good all defects.
GCC 46.1	The liquidated damages for the whole of the Works are Rs 3,000 per day for each works order. The maximum amount of liquidated damages for the whole of the works is 10% of the final value of the works certified.
GCC 47.1	The Bonus for the whole of the Works is <i>not applicable.</i>
GCC 48.1	The Advance Payments shall not be applicable.
GCC 49.1	The Performance Security amount is 10% of the contract price (including contingencies and VAT) in the form of a Bank Guarantee as per the format in section VIII and shall be valid until the end of the defects liability period. Where the Performance security and the insurance covers expire before the end of the date of completion of works, the contractor shall renew the insurance covers and the security to cover the period up to the completion of works and shall extend these to cover the maintenance period at no extra cost. The contractor shall inform the client in writing of the steps taken.
E. Finishing the Contract	
GCC 55.1	The date by which operating and maintenance manuals are required is <i>on the date of commissioning.</i> Not applicable
GCC 55.2	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date: Not Applicable.
GCC 57.2 (g)	The maximum number of days is: <u>180 days</u>
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 <u>15%.</u>

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.

Table of Forms

- 1. Letter of Acceptance**
- 2. Contract Agreement**
- 3. Performance Security**
- 4. Form for Preference Security**
- 5. Advance Payment Security**

Letter of Acceptance

[on letter head 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.