



Kenya National Highways Authority

Quality Highways, Better Connections

**EASTERN AFRICA REGIONAL TRANSPORT, TRADE AND
DEVELOPMENT FACILITATION PROJECT, (EARTTDFP)**

PROJECT ID: P148853

UPGRADING OF LOKICHAR-LOICHANGAMATAK (A1) ROAD

ICB NO : KeNHA/1979/2018

BIDDING DOCUMENT

FINAL BIDDING DOCUMENTS – VOLUME 1 OF 5

PART 1 – BIDDING PROCEDURES

- Section I: Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV: Bidding Forms
- Section V. Eligible Countries
- Section VI. Bank Policy – Corrupt and Fraudulent Practices

PART 2 – WORKS REQUIREMENTS

Section VII. Works Requirements

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

- Section VIII. General Conditions (GC)
- Section IX. Particular Conditions (PC)
- Section X: Contract Forms

VOLUME 2 OF 5 – BOOK OF DRAWINGS

VOLUME 3 OF 5 – FACTUAL MATERIALS REPORT

VOLUME 4 OF 5: ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT REPORT

VOLUME 5 OF 5 – KeNHA ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY (ESHS) POLICY

SEPTEMBER, 2018

**Director (Development)
Kenya National Highways Authority
P.O. Box 49712
NAIROBI, 00100**

**Director General
Kenya National Highways Authority
P.O. Box 49712
NAIROBI, 00100**

STANDARD BIDDING DOCUMENTS

Procurement of Works



April 2015

(updated January and October, 2017 only to enhance environmental, social, health and safety performance)

BIDDING DOCUMENTS

for

Procurement of

*Upgrading of Lokichar-Loichangamatak (A1)
Road*

ICB No: *KeNHA/1979/2018*

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Table of Contents

VOLUME 1 OF 5 – BIDDING PROCEDURES, WORKS REQUIREMENTS, CONDITIONS OF CONTRACT AND CONTRACT FORMS

PART 1 – Bidding Procedures	1
Section I. Instructions to Bidders	3
Section II. Bid Data Sheet	29
Section III. <i>Evaluation and Qualification Criteria (Without Prequalification)</i>	37
Section IV. Bidding Forms	53
Section V. Eligible Countries	151
PART 2 –Works Requirements	157
Section VII. Works Requirements	189
PART 3 – Conditions of Contract and Contract Forms	287
Section VIII. General Conditions (GC)	289
Section IX. Particular Conditions (PC).....	415
Section X. Contract Forms.....	429

VOLUME 2 OF 5 – BOOK OF DRAWINGS

VOLUME 3 OF 5 – FACTUAL MATERIALS REPORT

VOLUME 4 OF 5 - ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT REPORT

VOLUME 5 OF 5 – KeNHA ESHS POLICY

PART 1 – BIDDING PROCEDURES

Section I. Instructions to Bidders

Table of Contents

A. General.....	5
1. Scope of Bid.....	5
2. Source of Funds	5
3. Corrupt and Fraudulent Practices.....	6
4. Eligible Bidders	6
5. Eligible Materials, Equipment, and Services	9
B. Contents of Bidding Documents	9
6. Sections of Bidding Documents.....	9
7. Clarification of Bidding Documents, Site Visit, Pre-Bid Meeting	10
8. Amendment of Bidding Documents	11
C. Preparation of Bids	11
9. Cost of Bidding	11
10. Language of Bid.....	11
11. Documents Comprising the Bid.....	12
12. Letter of Bid and Schedules	12
13. Alternative Bids	13
14. Bid Prices and Discounts	13
15. Currencies of Bid and Payment	14
16. Documents Comprising the Technical Proposal.....	14
17. Documents Establishing the Qualifications of the Bidder	14
18. Period of Validity of Bids	15
19. Bid Security	16
20. Format and Signing of Bid.....	18
D. Submission and Opening of Bids.....	18
21. Sealing and Marking of Bids	18
22. Deadline for Submission of Bids	19
23. Late Bids	19
24. Withdrawal, Substitution, and Modification of Bids	19
25. Bid Opening	20
E. Evaluation and Comparison of Bids.....	21
26. Confidentiality	21
27. Clarification of Bids.....	21
28. Deviations, Reservations, and Omissions	22
29. Determination of Responsiveness.....	22
30. Nonmaterial Nonconformities	23

31.	Correction of Arithmetical Errors	23
32.	Conversion to Single Currency	24
33.	Margin of Preference	24
34.	Subcontractors.....	24
35.	Evaluation of Bids.....	24
36.	Comparison of Bids	25
37.	Qualification of the Bidder	26
38.	Employer’s Right to Accept Any Bid, and to Reject Any or All Bids	26
F. Award of Contract.....		26
39.	Award Criteria	26
40.	Notification of Award	26
41.	Signing of Contract	27
42.	Performance Security	27

Section I. Instructions to Bidders

A. General

1. **Scope of Bid**
 - 1.1 In connection with the Invitation for Bids specified in the Bid Data Sheet (BDS), the Employer, as specified in the BDS, issues these Bidding Documents for the procurement of Works as specified in Section VII, Works Requirements. The name, identification, and number of lots (contracts) of this International Competitive Bidding (ICB) process are specified in the BDS.
 - 1.2 Throughout these Bidding Documents:
 - (a) the term “in writing” means communicated in written form and delivered against receipt;
 - (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular;
 - (c) “day” means calendar day; and
 - (d) “ESHS” means environmental, social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), health and safety.
2. **Source of Funds**
 - 2.1 The Borrower or Recipient (hereinafter called “Borrower”) **specified in the BDS** has received or has applied for financing (hereinafter called “funds”) from the International Bank for Reconstruction and Development or the International Development Association (hereinafter called “the Bank”) in an amount **specified in the BDS**, toward the project named **in the BDS**. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which these Bidding Documents are issued.
 - 2.2 Payment by the Bank will be made only at the request of the Borrower and upon approval by the Bank, and will be subject, in all respects, to the terms and conditions of the Loan (or other financing) Agreement. The Loan (or other financing) Agreement prohibits a withdrawal from the Loan (or other financing) account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party

other than the Borrower shall derive any rights from the Loan (or other financing) Agreement or have any claim to the proceeds of the Loan (or other financing).

3. Corrupt and Fraudulent Practices

- 3.1 The Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section VI.
- 3.2 In further pursuance of this policy, Bidders shall permit and shall cause its agents (whether declared or not), sub-contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit the Bank to inspect all accounts, records and other documents relating to any prequalification process, bid submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Bank.

4. Eligible Bidders

- 4.1 A Bidder may be a firm that is a private entity, a government-owned entity—subject to ITB 4.5—or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution. **Unless specified in the BDS**, there is no limit on the number of members in a JV.
- 4.2 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:
 - (a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or
 - (b) receives or has received any direct or indirect subsidy from another Bidder; or
 - (c) has the same legal representative as another Bidder; or
 - (d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

- (e) 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 such Bidder is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid; or
 - (f) any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the bid; or
 - (g) any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the Contract implementation; or
 - (h) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or
 - (i) has a close business or family relationship with a professional staff of the Borrower (or of the project implementing agency, or of a recipient of a part of the loan) who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Bank throughout the procurement process and execution of the contract.
- 4.3 A Bidder may have the nationality of any country, subject to the restrictions pursuant to ITB 4.7. A Bidder shall be deemed to have the nationality of a country if the Bidder is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed sub-contractors or sub-consultants for any part of the Contract including related Services.
- 4.4 A Bidder that has been sanctioned by the Bank in accordance with the above ITB 3.1, including in accordance with the

Bank's Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants ("Anti-Corruption Guidelines"), shall be ineligible to be prequalified for, bid for, or be awarded a Bank-financed contract or benefit from a Bank-financed contract, financially or otherwise, during such period of time as the Bank shall have determined. The list of debarred firms and individuals is available as **specified in the BDS**.

- 4.5 Bidders that are Government-owned enterprises or institutions in the Employer's Country may participate only if they can establish that they (i) are legally and financially autonomous (ii) operate under commercial law, and (iii) are not dependent agencies of the Employer. To be eligible, a government-owned enterprise or institution shall establish to the Bank's satisfaction, through all relevant documents, including its Charter and other information the Bank may request, that it: (i) is a legal entity separate from the government (ii) does not currently receive substantial subsidies or budget support; (iii) operates like any commercial enterprise, and, inter alia, is not obliged to pass on its surplus to the government, can acquire rights and liabilities, borrow funds and be liable for repayment of its debts, and can be declared bankrupt; and (iv) is not bidding for a contract to be awarded by the department or agency of the government which under their applicable laws or regulations is the reporting or supervisory authority of the enterprise or has the ability to exercise influence or control over the enterprise or institution.
- 4.6 A Bidder shall not be under suspension from bidding by the Employer as the result of the operation of a Bid-Securing Declaration.
- 4.7 Firms and individuals may be ineligible if so indicated in Section V and (a) as a matter of law or official regulations, the Borrower's country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or the contracting of works or services required; or (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country.
- 4.8 This bidding is open only to prequalified Bidders unless **specified in the BDS**.

- 4.9 A Bidder shall provide such evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.
- 5. Eligible Materials, Equipment, and Services**
- 5.1 The materials, equipment and services to be supplied under the Contract and financed by the Bank may have their origin in any country subject to the restrictions specified in Section V, Eligible Countries, and all expenditures under the Contract will not contravene such restrictions. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.

B. Contents of Bidding Documents

- 6. Sections of Bidding Documents**
- 6.1 The Bidding Documents consist of Parts 1, 2, and 3, which include all the Sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITB 8.

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries
- Section VI. Bank Policy-Corrupt and Fraudulent Practices

PART 2 Works Requirements

- Section VII. Works Requirements

PART 3 Conditions of Contract and Contract Forms

- Section VIII. General Conditions (GC)
- Section IX. Particular Conditions (PC)
- Section X. Contract Forms

- 6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Documents.
- 6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the pre-Bid meeting (if any), or Addenda to the Bidding Documents in accordance with ITB 8. In case of any

contradiction, documents obtained directly from the Employer shall prevail.

- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents and to furnish with its bid all information and documentation as is required by the Bidding Documents.

7. Clarification of Bidding Documents, Site Visit, Pre-Bid Meeting

- 7.1 A Bidder requiring any clarification of the Bidding Documents shall contact the Employer in writing at the Employer's address **specified in the BDS** or raise its enquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so specified in the BDS, the Employer shall also promptly publish its response at the web page identified in the BDS. Should the clarification result in changes to the essential elements of the Bidding Documents, the Employer shall amend the Bidding Documents following the procedure under ITB 8 and ITB 22.2.
- 7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 If so specified in the BDS, the Bidder's designated representative is invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than one week before the meeting.
- 7.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3. Any modification to the Bidding Documents that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 8. Amendment of Bidding Documents**
- 8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Documents by issuing addenda.
- 8.2 Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents from the Employer in accordance with ITB 6.3. The Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.
- 8.3 To give Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer should extend the deadline for the submission of bids, pursuant to ITB 22.2

C. Preparation of Bids

- 9. Cost of Bidding**
- 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 10. Language of Bid**
- 10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language **specified in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language

specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents Comprising the Bid

11.1 The Bid shall comprise the following:

- (a) Letter of Bid and Appendix to Bid, in accordance with ITB 12;
- (b) completed schedules as required, including priced Bill of Quantities, in accordance with ITB 12 and 14;
- (c) Bid Security or Bid-Securing Declaration, in accordance with ITB 19.1;
- (d) alternative bids, if permissible, in accordance with ITB 13;
- (e) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;
- (f) documentary evidence in accordance with ITB 17 establishing the Bidder's continued qualified status or, if post-qualification applies, as specified in accordance with ITB 4.8, the Bidder's qualifications to perform the contract if its Bid is accepted;
- (g) Technical Proposal in accordance with ITB 16;
- (h) any other document **required in the BDS**.

11.2 In addition to the requirements under ITB 11.1, bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all members and submitted with the bid, together with a copy of the proposed Agreement.

11.3 The Bidder shall furnish in the Letter of Bid information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.

12. Letter of Bid and Schedules

12.1 The Letter of Bid and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.2. All blank spaces shall be filled in with the information requested.

13. Alternative Bids 13.1 **Unless otherwise specified in the BDS**, alternative bids shall not be considered.

13.2 When alternative times for completion are explicitly invited, a statement to that effect **will be included in the BDS**, as will the method of evaluating different times for completion.

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Documents must first price the Employer's design as described in the Bidding Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 **When specified in the BDS**, Bidders are permitted to submit alternative technical solutions for specified parts of the Works, and such parts **will be identified in the BDS**, as will the method for their evaluating, and described in Section VII, Works Requirements.

14. Bid Prices and Discounts

14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Bid and in the Bill of Quantities shall conform to the requirements specified below.

14.2 The Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Employer. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Bid, and provided that the Bid is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive bidders will be added to the bid price and the equivalent total cost of the bid so determined will be used for price comparison.

14.3 The price to be quoted in the Letter of Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered.

- 14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1.
- 14.5 **Unless otherwise specified in the BDS** and the Contract, the rates and prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.6 If so specified in ITB 1.1, bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer discounts for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 14.4, provided the bids for all lots (contracts) are opened at the same time.
- 14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
- 15. Currencies of Bid and Payment**
- 15.1 The currency(ies) of the bid and the currency(ies) of payments shall be **as specified in the BDS**.
- 15.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Adjustment Data in the Appendix to Bid are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.
- 16. Documents Comprising the Technical Proposal**
- 16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV – Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the work requirements and the completion time.
- 17. Documents Establishing the**
- 17.1 In accordance with Section III, Evaluation and Qualification Criteria, to establish that the Bidder continues to meet the

**Qualifications
of the Bidder**

criteria used at the time of prequalification, the Bidder shall provide in the corresponding information sheets included in Section IV, Bidding Forms, updated information on any assessed aspect that changed from that time, or if post-qualification applies as specified in ITB 4.8, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.

17.2 If a margin of preference applies as specified in accordance with ITB 33.1, domestic Bidders, individually or in joint ventures, applying for eligibility for domestic preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITB 33.1.

17.3 Any change in the structure or formation of a Bidder after being prequalified and invited to Bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Employer prior to the deadline for submission of Bids. Such approval shall be denied if (i) a Bidder proposes to associate with a disqualified Bidder or in case of a disqualified joint venture, any of its members; (ii) as a consequence of the change, the Bidder no longer substantially meets the qualification criteria set forth in Section III, Qualification Criteria and Requirements; or (iii) in the opinion of the Employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the Employer not later than fourteen (14) days after the date of the Invitation for Bids.

**18. Period of
Validity of Bids**

18.1 Bids shall remain valid for the period **specified in the BDS** after the bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A bid valid for a shorter period shall be rejected by the Employer as non responsive.

18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended for twenty-eight (28) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid, except as provided in ITB 18.3.

18.3 If the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Contract price shall be determined as follows:

- (a) In the case of fixed price contracts, the Contract price shall be the bid price adjusted by the factor **specified in the BDS**.
- (b) In the case of adjustable price contracts, no adjustment shall be made.
- (c) In any case, bid evaluation shall be based on the bid price without taking into consideration the applicable correction from those indicated above.

19. Bid Security

19.1 The Bidder shall furnish as part of its bid, either a Bid-Securing Declaration or a bid security **as specified in the BDS**, in original form and, in the case of a bid security, in the amount and currency **specified in the BDS**.

19.2 A Bid-Securing Declaration shall use the form included in Section IV, Bidding Forms.

19.3 If a bid security is specified pursuant to ITB 19.1, the bid security shall be a demand guarantee in any of the following forms at the Bidder's option:

- (a) an unconditional guarantee issued by a bank or financial institution (such as an insurance, bonding or surety company);
- (b) an irrevocable letter of credit;
- (c) a cashier's or certified check; or
- (d) another security **specified in the BDS**,

from a reputable source from an eligible country. If the unconditional guarantee is issued by a financial institution located outside the Employer's Country, the issuing financial institution shall have a correspondent financial institution located in the Employer's Country to make it enforceable. In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to bid submission. The bid security shall be valid for twenty-eight (28) days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.

- 19.4 If a bid security or Bid Securing Declaration is specified pursuant to ITB 19.1, any bid not accompanied by a substantially responsive bid security or Bid-Securing Declaration shall be rejected by the Employer as non responsive.
- 19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security pursuant to ITB 42.
- 19.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security, and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security.
- 19.7 The bid security may be forfeited or the Bid-Securing Declaration executed:
- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder; or
 - (b) if the successful Bidder fails to:
 - (i) sign the Contract in accordance with ITB 41; or
 - (ii) furnish a performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with ITB 42.
- 19.8 The bid security or the Bid-Securing Declaration of a JV shall be in the name of the JV that submits the bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the bid security or the Bid-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1 and ITB 11.2.
- 19.9 If a bid security is **not required in the BDS** pursuant to ITB 19.1, and
- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, or

- (b) if the successful Bidder fails to sign the Contract in accordance with ITB 41; or furnish a performance security and if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with ITB 42;

the Borrower may, **if provided for in the BDS**, declare the Bidder ineligible to be awarded a contract by the Employer for a period of time **as stated in the BDS**.

20. Format and Signing of Bid

- 20.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it "ORIGINAL." Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE." In addition, the Bidder shall submit copies of the bid, in the number **specified in the BDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
- 20.2 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. This authorization shall consist of a written confirmation **as specified in the BDS** and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.
- 20.3 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 20.4 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

- 21.1 The Bidder shall enclose the original and all copies of the bid, including alternative bids, if permitted in accordance with ITB 13, 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.

21.2 The inner and outer envelopes shall:

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

21.3 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid.

**22. Deadline for
Submission of
Bids**

22.1 Bids must be received by the Employer at the address and no later than the date and time **specified in the BDS. When so specified in the BDS**, bidders shall have the option of submitting their bids electronically. Bidders submitting bids electronically shall follow the electronic bid submission procedures **specified in the BDS**.

22.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Documents in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. Late Bids

23.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

**24. Withdrawal,
Substitution,
and
Modification of
Bids**

24.1 A Bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be:

- (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be

clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and

- (b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 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 Letter of Bid or any extension thereof.

25. Bid Opening

25.1 Except in the cases specified in ITB 23 and 24, the Employer shall publicly open and read out in accordance with ITB 25.3 all bids received by the deadline, at the date, time and place **specified in the BDS**, in the presence of Bidders` designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 22.1, shall be **as specified in the BDS**.

25.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked “SUBSTITUTION” shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked “MODIFICATION” shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only bids that are opened and read out at bid opening shall be considered further.

25.3 All other envelopes shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the total Bid Price, per lot (contract) if applicable, including any discounts and alternative bids; the presence or absence of a bid security, if required; and any other details as the

Employer may consider appropriate. Only discounts and alternative bids read out at bid opening shall be considered for evaluation. The Letter of Bid and the Bill of Quantities are to be initialed by representatives of the Employer attending bid opening in the manner **specified in the BDS**. The Employer shall neither discuss the merits of any bid nor reject any bid (except for late bids, in accordance with ITB 23.1).

- 25.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot (contract) if applicable, including any discounts and alternative bids; and the presence or absence of a bid security, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

E. Evaluation and Comparison of Bids

- 26. Confidentiality**
- 26.1 Information relating to the evaluation of bids and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with ITB 40.
- 26.2 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.
- 26.3 Notwithstanding ITB 26.2, from the time of bid opening to the time of Contract award, if a Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.
- 27. Clarification of Bids**
- 27.1 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, given a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic

errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 31.

- 27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.

**28. Deviations,
Reservations,
and Omissions**

- 28.1 During the evaluation of bids, the following definitions apply:

- (a) "Deviation" is a departure from the requirements specified in the Bidding Documents;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; and
- (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Documents.

**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 ITB11.

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

- (a) if accepted, would:
 - (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
 - (ii) limit in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the proposed Contract; or
- (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.

- 29.3 The Employer shall examine the technical aspects of the bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section VI, Works 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 Documents, it shall be rejected by the Employer

and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

**30. Nonmaterial
Nonconformities**

30.1 Provided that a bid is substantially responsive, the Employer may waive any nonconformities in the Bid.

30.2 Provided that a bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

30.3 Provided that a bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method specified in Section III, Evaluation and Qualification Criteria.

**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) 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.

- 31.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 31.1, shall result in the rejection of the Bid.
- 32. Conversion to Single Currency** 32.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency **as specified in the BDS.**
- 33. Margin of Preference** 33.1 **Unless otherwise specified in the BDS,** a margin of preference for domestic bidders¹ shall not apply.
- 34. Subcontractors** 34.1 **Unless otherwise stated in the BDS,** the Employer does not intend to execute any specific elements of the Works by sub-contractors selected in advance by the Employer.
- 34.2 In case of Prequalification, the Bidder's Bid shall name the same specialized subcontractor as submitted in the prequalification application and approved by the Employer.
- 34.3 In case of Postqualification, the Employer may permit subcontracting for certain specialized works as indicated in Section III 4.2. When subcontracting is permitted by the Employer, the specialized sub-contractor's experience shall be considered for evaluation. Section III describes the qualification criteria for sub-contractors.
- 34.4 Bidders may propose subcontracting up to the percentage of total value of contracts or the volume of works as **specified in the BDS.**
- 35. Evaluation of Bids** 35.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
- 35.2 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, but including Daywork items, where priced competitively;

¹ An individual firm is considered a domestic bidder for purposes of the margin of preference if it is registered in the country of the Employer, has more than 50 percent ownership by nationals of the country of the Employer, and if it does not subcontract more than 10 percent of the contract price, excluding provisional sums, to foreign contractors. JVs are considered as domestic bidders and eligible for domestic preference only if the individual member firms are registered in the country of the Employer or have more than 50 percent ownership by nationals of the country of the Employer, and the JV shall be registered in the country of the Borrower. The JV shall not subcontract more than 10 percent of the contract price, excluding provisional sums, to foreign firms. JVs between foreign and national firms will not be eligible for domestic preference.

- (b) price adjustment for correction of arithmetic errors in accordance with ITB 31.1;
- (c) price adjustment due to discounts offered in accordance with ITB 14.4;
- (d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 32;
- (e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 30.3;
- (f) the additional evaluation factors are specified in Section III, Evaluation and Qualification Criteria;

35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.

35.4 If these Bidding Documents allows Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Bid Form, is specified in Section III, Evaluation and Qualification Criteria.

35.5 If the bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

36. Comparison of Bids

36.1 The Employer shall compare the evaluated prices of all substantially responsive bids established in accordance with ITB 35.2 to determine the lowest evaluated bid.

- 37. Qualification of the Bidder**
- 37.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid either continues to meet (if prequalification applies) or meets (if postqualification applies) the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.
- 37.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1.
- 37.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Employer shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.
- 38. Employer's Right to Accept Any Bid, and to Reject Any or All Bids**
- 38.1 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. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

- 39. Award Criteria**
- 39.1 Subject to ITB 38.1, the Employer shall award the Contract to the Bidder who has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
- 40. Notification of Award**
- 40.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called 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"). At the same time, the Employer shall also notify all other Bidders of the results of the bidding and shall publish in *UNDB online* the results identifying the bid and lot (contract) numbers and the following information:

- (i) name of each Bidder who submitted a Bid;
- (ii) bid prices as read out at Bid Opening;
- (iii) name and evaluated prices of each Bid that was evaluated;
- (iv) name of bidders whose bids were rejected and the reasons for their rejection; and
- (v) name of the successful Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded.

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

40.3 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.1, requests in writing the grounds on which its bid was not selected.

41. Signing of Contract

41.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.

41.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

42. Performance Security

42.1 Within twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security and, if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security in accordance with the General Conditions of Contract, subject to ITB 35.5, using for that purpose the Performance Security and ESHS Performance Security Forms included in Section X, Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.

42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security and, if required in the BDS, the Environmental, Social, Health and Safety (ESHS) Performance Security or sign the Contract shall constitute

sufficient grounds for the annulment of the award and forfeiture of the bid security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

Section II. Bid Data Sheet

A. Introduction	
ITB 1.1	The number of the Invitation for Bids is : KE-KENHA-42522-CW-RFB
ITB 1.1	<u>The Employer is:</u> Kenya National Highways Authority P.O. BOX 49712-00100 Nairobi, Kenya
ITB 1.1	The name of the ICB is: Upgrading of Lokichar-Loichangamatak (A1) Road The identification number of the ICB is: KeNHA/1979/2018 The number and identification of lots (contracts) comprising this ICB is: Upgrading of Lokichar-Loichangamatak (A1) Road KeNHA/1979/2018
ITB 2.1	The Borrower is: Government of the Republic of Kenya
ITB 2.1	Loan or Financing Agreement amount: USD 500,000,000
ITB 2.1	The name of the Project is: Eastern Africa Regional Transport, Trade and Development Facilitation Project, (EARTTDFP)
ITB 4.1	Maximum number of members in the JV shall be: Three (3)
ITB 4.4	A list of debarred firms and individuals is available on the Bank's external website: http://www.worldbank.org/debarr .
ITB 4.8	This Bidding Process <i>IS NOT</i> subject to prequalification.
B. Bidding Documents	
ITB 7.1	For clarification purposes only, the Employer's address is: Attention: Director (Development), Kenya National Highways Authority Street Address: Blue Shield Towers, Hospital Road Floor/Room number: Second Floor City: Nairobi ZIP Code: 49712-00100 Country: Kenya Telephone: (+254-2) -4954214 Electronic mail address: ddevelopment@kenha.co.ke
ITB 7.1	Web page: www.kenha.co.ke
ITB 7.4	A Pre-Bid meeting shall take place at the following date, time and place: Date: 28 th September 2018

	<p>Time: 1000 hours Place: Blue Shield Towers, Hospital Road, Nairobi Room: 3rd Floor Conference Room</p> <p>A site visit conducted by the Employer shall be organized at the following date, time and place: Date: 25th September 2018 Time: 1000 hours Place: Lokichar (start of the project)</p>
C. Preparation of Bids	
ITB 10.1	<p>The language of the bid is: English</p> <p>All correspondence exchange shall be in English language.</p> <p>Language for translation of supporting documents and printed literature is English</p>
ITB 11.1 (h)	<p>The Bidder shall submit with its bid the following additional documents:</p> <p>Code of Conduct (ESHS)</p> <p>The Bidder shall submit its Code of Conduct that will apply to Contractor's Personnel (as defined in Sub-clause 1.1.2.7 of the GC), to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract.</p> <p>A satisfactory code of conduct will contain obligations on all Contractor's Personnel project staff (including sub-contractors and day workers) that are suitable to address the following issues, as a minimum. Additional obligations may be added to respond to particular concerns of the region, the location and the project sector or to specific project requirements. The code of conduct shall contain a statement that the term "child" / "children" means any person(s) under the age of 18 years.</p> <p>The issues to be addressed include:</p> <ol style="list-style-type: none"> 1. Compliance with applicable laws, rules, and regulations 2. Compliance with applicable health and safety requirements to protect the local community, the Employer's Personnel, and the Contractor's Personnel 3. Interactions with the local community(ies), members of the local community (ies), and any affected person(s) (for example to convey an attitude of respect, including to their culture and traditions)

	<ol style="list-style-type: none"> 4. Sexual harassment 5. Violence, including sexual and/or gender based violence 6. Protection of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior towards children, limiting interactions with children, and ensuring their safety in project areas) 7. Sanitation requirements 8. Non retaliation against workers who report violations of the Code, if that report is made in good faith. <p>The Code of Conduct should be written in plain language and signed by each worker to indicate that they have:</p> <ul style="list-style-type: none"> • received a copy of the code; • had the code explained to them; • acknowledged that adherence to this Code of Conduct is a condition of employment; and • understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities. <p>In addition, the Bidder shall provide details on how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches. The Contractor shall be required to implement the agreed Code of Conduct</p> <p>Management Strategies and Implementation Plans (MSIP) to manage the (ESHS) risks</p> <p>The Bidder shall submit Management Strategies and Implementation Plans (MSIP) to manage the following key Environmental, Social, Health and Safety (ESHS) risks:</p> <ul style="list-style-type: none"> • Water Resource Protection Plan to prevent contamination of drinking water; • Boundary Marking and Protection Strategy for mobilization and construction to prevent offsite adverse impacts; • Strategy for obtaining Consents/Permits prior to the start of relevant works such as opening a quarry or borrow pit; • Gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan; • Traffic Management Plan to ensure safety of local communities from construction traffic;
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	<ul style="list-style-type: none"> Operational Health and Safety (OHS) plan <p>The Contractor shall be required to submit for approval, and subsequently implement, the Contractor's Environment and Social Management Plan (C-ESMP), in accordance with the Particular Conditions of Contract Sub-Clause 4.1, that includes the agreed Management Strategies and Implementation Plans</p>
ITB 13.1	Alternative bids ARE NOT permitted.
ITB 13.2	Alternative times for completion ARE NOT permitted.
ITB 13.4	Alternative technical solutions shall be permitted for the following parts of the Works: NONE .
ITB 14.5	The prices quoted by the bidder shall be: subject to adjustment during execution of the contract .
ITB 15.1	<p>The currency(ies) of the bid and the payment currency(ies) shall be in accordance with Alternative A as described below:</p> <p>Alternative A (Bidders to quote entirely in local currency):</p> <p>(a) The unit rates and the prices shall be quoted by the Bidder in the Bill of Quantities, entirely in Kenya Shillings, the name of the currency of the Employer's country, and further referred to as "the local currency". A Bidder expecting to incur expenditures in other currencies for inputs to the Works supplied from outside the Employer's country (referred to as "the foreign currency requirements") shall indicate in the Appendix to Bid - Table C, the percentage(s) of the Bid Price (excluding Provisional Sums), needed by the Bidder for the payment of such foreign currency requirements, limited to no more than three foreign currencies.</p> <p>(b) The rates of exchange to be used by the Bidder in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Bidder in the Appendix to Bid - Table C, and shall apply for all payments under the Contract so that no exchange risk will be borne by the successful Bidder.</p>
ITB 18.1	The bid validity period shall be 120 days.
ITB 18.3 (a)	The bid price shall be adjusted by the following factor: NOT APPLICABLE
ITB 19.1	<p>A <i>Bid Security</i> IS required.</p> <p>The amount and currency of the bid security shall be Seventy Five Million Kenya Shillings (KShs. 75,000,000.00) or an equivalent amount in a freely convertible currency.</p> <p>The Bid Security shall be an unconditional demand guarantee issued by a Bank.</p>

	A Bid Security issued by a financial institution located outside Kenya shall be validated by a correspondent bank registered in Kenya and evidence of this validation shall be attached to the Bid Security.
ITB 19.3	The bid security shall be an unconditional guarantee issued by a bank from a reputable source from an eligible country. The bid security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to bid submission. The bid security shall be valid for twenty-eight (28) days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.
ITB 19.9	Not Applicable
ITB 20.1	ONE Original and TWO hard copies TWO scanned/digital copies on compact disk in PDF format, with the disks clearly labelled. In case of any discrepancy, original bid shall prevail.
ITB 20.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: A duly signed power of attorney indicating the name and position held by the person authorized to sign the bid on behalf of the bidder.
D. Submission and Opening of Bids	
ITB 22.1	For <u>bid submission purposes</u> only, the Employer's address is: Attention: Deputy Director (Supply Chain Management) Kenya National Highways Authority Street Address: Blue Shield Towers, Hospital Road, Upper Hill Floor/Room number: First Floor, Procurement Office City: Nairobi ZIP Code: 49712-00100 Country: KENYA The deadline for bid submission is: Date: 23rd October 2018 Time: 1100 Hrs Bidders <i>DO NOT</i> have the option of submitting their bids electronically.
ITB 25.1	The bid opening shall take place at: Street Address: Blue Shield Towers, Hospital Road, Upper Hill Floor/Room number: Third Floor Board Room City: Nairobi

	<p>Country: Kenya</p> <p>Date: 23rd October 2018</p> <p>Time: 1100 Hrs</p>
ITB 25.3	<p>The Letter of Bid and Priced Bill of Quantities shall be initialed by at least three (3) representatives of the Employer conducting Bid opening:</p> <p>Each Bid shall be initialed by all representatives and shall be numbered. Any modifications to the unit or total price shall be initialed by the Representatives of the Employer by stamping/initialing all of the pages.</p>
E. Evaluation, and Comparison of Bids	
ITB 32.1	<p>The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: Kenya Shillings</p> <p>The source of exchange rate shall be: Central Bank of Kenya Selling rate</p> <p>The date for the exchange rate shall be: 28 days before the deadline for bid submission</p> <p>The currency(ies) of the Bid shall be converted into a single currency in accordance with the procedure under Alternative A that follows:</p> <p>Alternative A: Bidders quote entirely in local currency</p> <p>For comparison of bids, the Bid Price, corrected pursuant to Clause 31, shall first be broken down into the respective amounts payable in various currencies by using the exchange rates specified by the bidder in accordance with Sub-Clause 15.1.</p> <p>In the second step, the Employer will convert the amounts in various currencies in which the Bid Price is payable (excluding Provisional Sums but including Daywork where priced competitively) to the single currency identified above at the selling rates established for similar transactions by the authority specified and on the date stipulated above.</p>
ITB 33.1	A margin of preference SHALL NOT apply.
ITB 34.1	At this time the Employer DOES NOT INTEND to execute certain specific parts of the Works by sub-contractors selected in advance.
ITB 34.4	<p><i>In the case of Postqualification:</i></p> <p>a) Contractor's proposed subcontracting: Maximum percentage of subcontracting permitted is: 30% of the total contract amount.</p> <p>b) Bidders planning to subcontract more than 10% of total volume of work shall specify, in the Letter of Bid, the activity (ies) or parts of the works to be subcontracted along with complete details of the sub-contractors and their</p>

	<p>qualification and experience. The qualification and experience of the sub-contractors must meet the minimum criteria for the relevant work to be sub-contracted failing which such sub-contractors will not be permitted to participate.</p> <p>c) Sub-contractors' qualification and experience will not be considered for evaluation of the Bidder. The Bidder on its own (without taking into account the qualification and experience of the sub-contractor) should meet the qualification criteria.</p>
ITB 42.1 and 42.2	<p>The successful Bidder shall be required to submit an Environmental, Social, Health and Safety (ESHS) Performance Security in the amount of two (2) percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.</p>

Section III. *Evaluation and Qualification*

Criteria

(Without Prequalification)

This Section contains all the criteria that the Employer shall use to evaluate bids and qualify Bidders. In accordance with ITB 35 and ITB 37, no other factors, methods or criteria shall be used. The Bidder shall provide all the information requested in the forms included in Section IV, Bidding Forms.

Wherever a Bidder is required to state a monetary amount, Bidders should indicate the USD equivalent using the rate of exchange determined as follows:

- For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted) was originally established.

- Value of single contract - Exchange rate prevailing on the date of the contract.

Exchange rates shall be taken from the publicly available source identified in the ITB 32.1. Any error in determining the exchange rates in the Bid may be corrected by the Employer.

1. Domestic Preference – Not Applicable

2. Evaluation

In addition to the criteria listed in ITB 35.2 (a) – (e) the following criteria shall apply:

- 2.1 Assessment of adequacy of Technical Proposal with Requirements**
- 2.2 Multiple Contracts-NOT APPLICABLE**
- 2.3 Alternative Completion Times**, if permitted under ITB 13.2, will be evaluated as follows: **NOT APPLICABLE**
- 2.4 Technical alternatives**, if permitted under ITB 13.4, will be evaluated as follows: **NOT APPLICABLE**
- 2.5 Non compliance with environmental and social requirements:** bidders who have any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social, (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), or health or safety requirements or safeguard in the past five years may, in consultation with the Bank, be excluded from eligibility for award.
- 2.6 Entities under investigation or suspension by the Bank:** bidders determined to be under ongoing suspension or investigation by the Bank for malpractice and who have been notified accordingly may, in consultation with the Bank, be excluded from eligibility for award.
- 2.7 Ongoing arbitration processes:** bidders having ongoing unresolved arbitration processes between themselves and the Kenya National Highways Authority involving disputed amounts of more than USD 1,000,000 may, in consultation with the Bank, be excluded from eligibility for award.

2.5 Specialized Subcontractors

Only the specific experience of sub-contractors for specialized works permitted by the Employer will be considered. The general experience and financial resources of the specialized sub-contractors shall not be added to those of the Bidder for purposes of qualification of the Bidder. The specialized sub-contractors proposed shall be fully qualified for their work proposed, and meet the following criteria:

- Shall have a minimum of three (3) years demonstrable experience in the roads sector
- Shall be able to provide audited financial accounts for the last three (3) years

3. Qualification

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
1. Eligibility							
1.1	Nationality	Nationality in accordance with ITB 4.3	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
1.2	Conflict of Interest	No conflicts of interest in accordance with ITB 4.2	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
1.3	Bank Eligibility	Not having been declared ineligible by the Bank, as described in ITB 4.4, 4.5, 4.6 and 4.7	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Letter of Bid
1.4	Government Owned Entity of the Borrower country	Meets conditions of ITB 4.5	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments
1.5	United Nations resolution or Borrower’s country law	Not having been excluded as a result of prohibition in the Borrower’s country laws or official regulations against commercial relations with the Bidder’s country, or by an act of compliance with UN Security Council resolution, both in accordance with ITB 4.7 and Section V.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Forms ELI – 1.1 and 1.2, with attachments

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
2. Historical Contract Non-Performance							
2.1	History of Non-Performing Contracts	Non-performance of a contract ² did not occur as a result of contractor default within the last five years	Must meet requirement ¹²	Must meet requirements	Must meet requirement ³	N/A	Form CON-2
2.2	Suspension Based on Execution of Bid Securing Declaration by the Employer or withdrawal of the Bid within Bid validity	Not under suspension based on execution of a Bid Securing Declaration pursuant to ITB 4.6 or withdrawal of the Bid pursuant ITB 19.9.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Bid Submission Form
2.3	Pending Litigation	Bidder’s financial position and prospective long term profitability sound according to criteria established in 3.1 below and assuming that all pending litigation will be resolved against the Bidder	Must meet requirement	N/A	Must meet requirement	N/A	Form CON – 2
2.4	Litigation History	No consistent history of court/arbitral award decisions against the Bidder ⁴ within the last	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Form CON – 2

² Non performance, as decided by the Employer, shall include all contracts where (a) non performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Non performance shall not include contracts where Employers decision was overruled by the dispute resolution mechanism. Non performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

³ This requirement also applies to contracts executed by the Bidder as JV member.

⁴ The Bidder shall provide accurate information on the letter of Bid about any litigation or arbitration resulting from contracts completed or ongoing under its execution over the last five years. A consistent history of court/arbitral awards against the Bidder or any member of a joint venture may result in disqualifying the Bidder.

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
		five years					
2.5	Declaration: Environmental, Social, Health, and Safety (ESHS) past performance	Declare any civil work contracts that have been suspended or terminated and/or performance security called by an employer for reasons related to the non-compliance of any environmental, or social, (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), or health or safety requirements or safeguard in the past five years ⁵ .	Must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized Sub-contractor/s must also make the declaration.	N/A	Each must make the declaration. Where there are Specialized Sub-contractor/s, the Specialized Sub-contractor/s must also make the declaration.	N/A	Form CON-3 ESHS Performance Declaration

⁵ The Employer may use this information to seek further information or clarifications in carrying out its due diligence.

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
3. Financial Situation and Performance							
3.1	Financial Capabilities	The Bidder shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as USD 7 (seven) million for the subject contract(s) net of the Bidders other commitments (ii) The Bidders shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments. (iii) The audited balance sheets or, if not required by the laws of the Bidder's country, other financial statements acceptable to the Employer, for the last 5 (<i>five</i>) years shall be submitted and must	Must meet requirement Must meet requirement	Must meet requirement Must meet requirement	N/A N/A Must meet requirement	N/A N/A N/A	Form FIN – 3.1, with attachments

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
		demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability.		N/A			
3.2	Average Annual Construction Turnover	Minimum average annual construction turnover of US\$ 40 <i>Million (Forty Million)</i> calculated as total certified payments received for contracts in progress and/or completed within the last 5 years, divided by 5 years	Must meet requirement	Must meet requirement	Must meet 40%, of the requirement	Must meet 70%, of the requirement ⁶	Form FIN – 3.2

⁶ The joint venture must demonstrate that atleast one member meets 70% of the requirements and the other members must meet atleast 40% of the requirements.

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
4. Experience							
4.1 (a)	General Construction Experience	Experience under construction contracts in the role of prime contractor, JV member, sub-contractor, or management contractor for at least the last <i>10 years</i> , starting <i>1st January 2008</i> .	Must meet requirement	N/A	Must meet requirement	N/A	Form EXP – 4.1
4.2 (a)	Specific Construction & Contract Management Experience	(i) A minimum number of similar ⁷ contracts specified below that have been satisfactorily and substantially ⁸ completed as a prime contractor, joint venture member ⁹ , management contractor or sub-contractor between <i>1st January, 2008</i> and bid submission deadline: (i) <i>Two (2)</i> contracts, each of minimum value <i>USD 40,000,000</i>	Must meet requirement	Must meet requirement ¹⁰	N/A	N/A	Form EXP 4.2(a)

⁷ The similarity shall be based on the physical size, complexity, methods/technology and/or other characteristics described in Section VII, Work's Requirements.

Summation of number of small value contracts (less than the value specified under requirement) to meet the overall requirement will not be accepted.

⁸ Substantial completion shall be based on 80% or more works completed under the contract.

⁹ For contracts under which the Bidder participated as a joint venture member or sub-contractor, only the Bidder's share, by value, shall be considered to meet this requirement. Attach letters of Awards, completion certificates and any other supporting document.

¹⁰ In the case of JV, the value of contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single contract has been met. Instead, each contract performed by each member shall satisfy the minimum value of a single contract as required for single entity. In determining whether the JV meets the requirement of total number of contracts, only the number of contracts completed by all members each of value equal or more than the minimum value required shall be aggregated.

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
		or <i>one contract of at least \$80 (eighty) million</i> and (ii) at least one contract of \$25 million outside home country for foreign bidders.					
4.2 (b)		For the above and any other contracts completed and under implementation as prime contractor, joint venture member, management contractor or sub-contractor ¹¹ on or after the first day of the calendar year during the period stipulated in 4.2 (a) above, a minimum construction experience in the following key activities successfully completed ¹² :	Must meet requirements	Must meet requirements	N/A	N/A	Form EXP – 4.2 (b)

¹¹ For contracts under which the Bidder participated as a joint venture member or sub-contractor, only the Bidder's share shall be counted to meet this requirement.

¹² Volume, number or rate of production of any key activity can be demonstrated in one or more contracts combined if executed during same time period. The rate of production shall be the annual production rate for the key construction activity (or activities).

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
		<div><div>1. Fill in soft or hard material 58,000 m3 per month</div><div>2. Bituminous Mixes (dense bitumen macadam) 1,450 m3 per month</div><div>3. Graded crushed stone laid by paver 4,550 m3 per month</div><div>4. Cement or lime Treated Natural material Sub-base or Base processed by stationary plant: 4,600 m3 per month</div><div>5. Concrete Works 1,100 m³ per month</div></div> <div><i>The Contractor to state volume, number or rate of production as applicable]</i>¹³</div>					

¹³ The minimum experience requirement for multiple contracts will be the sum of the minimum requirements for respective individual contracts.

Note: [It is desirable to attach Completion Certificates, Award Letters etc as supporting evidence of the contractor's experience]

3.5 Contractor's Representative and Key Personnel

The Bidder must demonstrate that it will have a suitably qualified Contractor's Representative and suitably qualified (and in adequate numbers) Key Personnel, as described in the table below.

The Bidder shall provide details of the Contractor's Representative and Key Personnel and such other Key Personnel that the Bidder considers appropriate to perform the Contract, together with their academic qualifications and work experience. The Bidder shall complete the relevant Forms in Section IV, Bidding Forms.

The Contractor shall require the Employer's consent to substitute or replace the Contractor's Representative (reference General Conditions of Contract Sub Clause 4.3) and any of the Key Personnel (reference the Particular Conditions of Contract Sub Clause 1.1.2.7).

Contractor's Representative and Key Personnel

No.	Position	Relevant academic qualifications	Total Work Experience (years)	Experience In Similar Works (years)
1	BRANCH MANAGER/COUNTRY MANAGER		15	7
2	FINANCIAL MANAGER/ CHIEF ACCOUNTANT.		15	7
3	PROJECT MANAGER**		15	7
4	EARTHWORKS/ROADS ENGINEER		10	7
5	DRAINAGE ENGINEER		10	7
6	PAVEMENT ENGINEER		10	7
7	MATERIALS ENGINEER (WITH EARTHWORKS, STRUCTURAL CONCRETE, AC AND DBM EXPERIENCE)		15	7
8	SENIOR SURVEYOR.		10	7
9	BRIDGE ENGINEER		10	7
10	PLANT/EQUIPMENT MANAGER.		10	7
11	ASPHALT PLANT MANAGER		10	7

12	SUPERINTENDENT EARTHWORKS.		10	7
13	SUPERINTENDENT DRAINAGE WORKS.		10	7
14	SUPERINTENDENT BITUMINOUS WORKS		10	7
15	SUPERINTENDENT BRIDGE WORKS		10	7
16	ENVIRONMENTAL SAFEGUARDS SPECIALIST		7	4
17	SOCIAL SAFEGUARDS SPECIALIST		7	4
18	HEALTH AND SAFETY SAFEGUARDS SPECIALIST		7	4

**Branch Manager/Country Manager and Financial Manager/Chief Accountant (or equivalent) will be expected to be resident in the country of the Employer and will be directly involved in administration and coordination of the Contractor's works resources in the execution of the contract.*

***The Project Manager should have worked on at least one project outside the contractor's home country*

All the above named Personnel **must** be fluent in reading, written and spoken English. Fluency in reading, written and spoken English is subject to Employer's consent and shall be assessed and approved by the Employer prior to deployment of the above personnel by the Contractor. The key staff should have atleast 3 years of experience outside home country for foreign bidders.

The Bidder shall provide details of the proposed personnel and their experience records using Forms PER-1 and PER-2 included in Section IV, Bidding Forms.

3.6 Equipment

The Bidder must demonstrate that it has the key equipment listed hereafter:

No.	Equipment Type and Characteristics	Minimum Number required per Contract
1	Bulldozer Cat D8 or Equivalent	4
2	Grader Cat 14h or Equivalent	4
3	Asphalt Plant 80t/Hr	1
4	Asphalt Paver/Finisher Capable of Laying Pavement Layers to Full Width of Construction	2
5	Roller Self Propelled	
	a. 20t Pneumatic	4
	b. 15t Smooth Drum Vibratory	4
	c. 20t Sheepsfoot	2
6	Hydraulic Excavator CAT 322 or Equivalent with Rock Hammer	4
7	Wheel Loader 4WD Articulated CAT 950 or Equivalent	4
8	Low Loader 30t Capacity	2
9	Tip Truck 15t Gross Capacity	20
10	Water Tanker 9000l Capacity	10
11	Pressure Bitumen Distributor Min 5000l	1
12	Chip Spreader Self Propelled	1
13	Stone Crusher And Associated Power Screens 150tph	1
14	Concrete Mixer 3m ³ Capacity	2
15	Mobile Crane 30t Capacity	1
16	Pugmill 250tph Capacity: 3no. Bins & Full Logic Control	1
17	Pulvimixer	2
18	Pile boring rig	1
19	Mechanical broom	1
20	Air compressor	1
21	Concrete poker vibrators	1
22	Road marking equipment	1
23	Crash barrier post driving equipment	1

The Bidder shall provide further details of proposed items of equipment using Form EQU in Section IV, Bidding Forms.

Section IV. Bidding Forms

Table of Forms

Letter of Bid.....	54
Appendix to Bid.....	57
Table A. Local Currency.....	57
Table B. Foreign Currency (FC).....	59
Table C. Summary of Payment Currencies.....	61
Bill of Quantities	62
Preamble	62
GRAND SUMMARY OF BILLS OF QUANTITIES	100
Technical Proposal.....	115
Site Organization	116
Method Statement	117
Mobilization Schedule	118
Construction Schedule	119
ESHS Management Strategies and Implementation Plans	120
Code of Conduct: Environmental, Social, Health and Safety (ESHS)	121
Form EQU: Equipment	122
Personnel.....	123
Form PER -1	123
Form PER-2:	125
Quality Assurance Systems.....	127
Breakdown of unit Rates.....	128
Others 130	
Bidders Qualification without prequalification	131
Form ELI -1.1	132
Form ELI -1.2	133
Form CON – 2	134
Form CON – 3	136
Form FIN – 3.1:	138
Form FIN – 3.2:	140
Form FIN – 3.3:	141
Form FIN – 3.4:	142
Form EXP - 4.1	143
Form EXP - 4.2(a).....	144
Form EXP - 4.2(b)	146
Form of Bid Security	149

Letter of Bid

Date: _____

ICB No.: _____

Invitation for Bid No.: _____

Alternative 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 8) _____;
- (b) We meet the eligibility requirements and have no conflict of interest in accordance with ITB 4;
- (c) We have not been suspended nor declared ineligible by the Employer based on execution of a Bid Securing Declaration in the Employer's country in accordance with ITB 4.6.
- (d) We offer to execute in conformity with the Bidding Documents the following Works: _____;
- (e) The total price of our Bid, excluding any discounts offered in item (f) below is:
In case of only one lot, total price of the Bid _____

In case of multiple lots, total price of each lot _____
In case of multiple lots, total price of all lots (sum of all lots) _____;
- (f) The discounts offered and the methodology for their application are:
 - i) The discounts offered are: _____
 - ii) The exact method of calculations to determine the net price after application of discounts is shown below:

_____;
- (g) Our bid shall be valid for a period of _____ 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;

- (h) If our bid is accepted, we commit to obtain a performance security [*and an Environmental, Social, Health and Safety (ESHS) Performance Security, Delete if not applicable*] in accordance with the Bidding Documents;
- (i) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.2(e), other than alternative bids submitted in accordance with ITB 13;
- (j) We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by a member of the World Bank Group or a debarment imposed by the World Bank Group in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the World Bank and other development banks. Further, we are not ineligible under the Employer's country laws or official regulations or pursuant to a decision of the United Nations Security Council;
- (k) We are not a government owned entity/ We are a government owned entity but meet the requirements of ITB 4.5;¹⁴
- (l) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract:

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(If none has been paid or is to be paid, indicate "none.")

- (m) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (n) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (o) We hereby certify that 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.

Name of the Bidder* _____

¹⁴ Bidder to use as appropriate. ¹⁵ If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

Name of the person duly authorized to sign the Bid on behalf of the Bidder** _____

Title of the person signing the Bid _____

Signature of the person named above _____

Date signed _____ day of _____, _____

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid

Appendix to Bid

Schedule of Adjustment Data

In Tables A, B, and C, below, the Bidder shall (a) indicate its amount of local currency payment, (b) indicate its proposed source and base values of indices for the different foreign currency elements of cost, (c) derive its proposed weightings for local and foreign currency payment, and (d) list the exchange rates used in the currency conversion.

Table A. Local Currency

Index code*	Index description*	Source of index*	Base value and date*	Bidder's related currency amount	Bidder's proposed weighting
Fixed	Nonadjustable	—	—	—	A= 0.15
LL	Local labour				B= 0.07 - 0.20
FU	Fuel and Lubricants				C=0.10 – 0.45
CE	Cement				D=0.02-0.10
BI	Bitumen				E=0.3-0.35
EX	Explosives				F=0.01-0.05
RS	Reinforcement Steel				G=0.05-0.2
Total					1.00

[Whereas “A” is fixed percentage, the bidder is required to specify a value within the given range for B, C, D, E, F,G and H such that the total weighting = 1.00]

- (1) Base date is the date defined in the General Conditions of Contract, and the Base value is that value at the Base Date
- (2) Sources of indices are to be attached as a table giving :
 - Index Code
 - Index Description
 - Currency of Index
 - Details and Source of Index
 - Base Value and Base Date of Index

NOTE 1: Only sources of indices that publish data to the public and are freely accessible to the Employer shall be used. Reference prices are not acceptable as sources of indices.

NOTE 2: Sources of indices must be supported by copies of relevant published data

NOTE 3: Base values and dates must be supported by copies of relevant published data

- (3) Price Adjustment Formula for Local Currency Component shall be in accordance with Sub-Clause 13.8 of the General Conditions of Contract.

Table B. Foreign Currency (FC)

State type:

Index code	Index description	Source of index (To be attached by Bidder (1))	Base value and date	Bidder's related source currency in type/amount	Equivalent in FC1	Bidder's proposed weighting
Fixed	Nonadjustable	—	—	—	—	A= 0.15
EL	Expatriate Labour					B= 0.07 - 0.012
FU	Fuel and Lubricants					C=0.10 – 0.45
CE	Cement					D=0.05-0.10
EQ	Contractor's Equipment and Spares					E=0.25-0.40
RS	Reinforcement Steel					F=0.05-0.2
EX	Explosives					G=0.01-0.05
BI	Bitumen					H=0.30-0.35
Total						1.00

[Whereas “A” is fixed percentage, the bidder is required to specify a value within the given range for B, C, D, E, F, G and H such that the total weighting = 1.00]

- (1) Base data is the date defined in the General Conditions of Contract, and the Base value is that value at the Base Date
- (2) Sources of indices are to be attached as a table giving:
 - Index Code
 - Index Description
 - Currency of Index
 - Details and Source of Index
 - Base Value and Base Date of Index

NOTE 1: Only sources of indices that publish data to the public and are freely accessible to the Employer shall be used. Reference prices are not acceptable as sources of indices.

NOTE 2: Sources of indices must be supported by copies of relevant published data

NOTE 3: Base values and dates must be supported by copies of relevant published data

- (3) This table should be repeated for each foreign currency
- (4) The rate of exchange is
- (5) Price Adjustment Formula for foreign Currency Component shall be in accordance with Sub-Clause 13.8 of the General Conditions of Contract.

Table C. Summary of Payment Currencies

Table: Alternative A

Lot 1: Rehabilitation of Lokichar-Loichangamatak (A1) Road

Name of payment currency	A Amount of currency	B Rate of exchange (local currency per unit of foreign)	C Local currency equivalent $C = A \times B$	D Percentage of Total Bid Price (TBP) $\frac{100 \times C}{TBP}$
Local currency _____		1.00		
Foreign currency #1 _____				
Foreign currency #2 _____				
Foreign currency # _____				
Total Bid Price				100.00
Provisional sums expressed in local currency	870,100,000		870,100,000	
TOTAL BID PRICE (including provisional sum)				

Bill of Quantities

Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions of Contract, Technical Specifications and Drawings.
2. The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.
3. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
4. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities.
5. The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all constructional plant to be used, labour, insurance, supervision, compliance testing, materials, erection, maintenance of works, overheads and profits, taxes and duties together with all general risks, liabilities and obligations set out or implied in the Contract, transport, electricity and telephones, water, use and replenishment of all consumables, including those required under the Contract by the Engineer and his staff.
6. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
7. Any entry of "nil" or any other price or rate that shall render the Bid unresponsive in accordance with Clause 29 of the instructions to Bidders, unless deemed justifiably covered elsewhere in the Bills of Quantities, may lead to the entire Bid being rejected
8. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
9. General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
10. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Clause 13 of the Conditions of Contract.
11. The method of measurement of completed work for payment shall be in accordance with *Standard Specification for Road and Bridge Construction* of the Ministry of Transport and Communications, 1986.
12. "Authorized" "Directed" or "Approved" shall mean the authority, direction or approval of the Engineer.
13. Unless otherwise stated, all measurements shall be net taken on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions required in this contract.

Any work performed in excess of the requirements of the plans and Specifications will not be paid for, unless ordered in writing by the Engineer.

14. Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:
- (a) Where there is a discrepancy between amounts in figures and in words, the amount in words will govern; and
 - (b) where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit price, in which event the total amount as quoted will govern and the unit rate will be corrected.
- 15.
- (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledge hammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 300 kilowatt power with a single, rear-mounted, hydraulic ripper. Boulders of more than 0.2m³ occurring in soft material shall be classified as hard material
 - (b) Soft material shall be all material other than hard material.
16. The Contractor shall be entitled to payments due in respect of: -
- i) Equipment employed on Daywork basis on the rental rates entered by him in the “schedule of Dayworks: Plant”
 - ii) That Labour (ordinary) employed on daywork basis at the rates entered by him in the “Schedule of Daywork: Labour”
 - iii) Materials used on daywork at the rates entered by him in the “Schedule of Dayworks: Materials”.
17. Units of Measurement and Abbreviations used herein shall have the following meanings:

Unit	Abbreviation	Unit	Abbreviation
cubic meter	m ³ or cu m	millimetre	mm
hectare	Ha	month	mth
hour	hr.	number	No.
House-month	hse-month		
kilogram	Kg	provisional sum	Prov. Sum
kilometre	Km		
lump sum	L.sum.	square meter	m ² or sq m
man month	m mth	square millimetre	mm ² or sq mm
meter	M	vehicle	veh
metric tonne (1,000kg)	T	vehicle month	v mth
litres	ltrs	week	wk

BILL NO. 1 : PRELIMINARY AND SUPERVISORY/SUPPORT SERVICES					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	NOTE; The following items for housing, offices and laboratory for the Engineer shall be deemed to include all costs involved in providing and maintaining such buildings, including furniture, fittings, internet/WiFi and access thereto and for the provision of security, heating, lighting, power, water, sewage and refuse disposal, as required for the duration of the contract.				
1.01	Provide and maintain furnished houses for the Engineer's staff, including provision of the furniture to each house type, as listed in the Special Specifications. All items to be approved prior to purchase by the Engineer.				
	(a) Accommodation for Engineer's senior staff				
	(i) House Type I	No.	1		
	(ii) House Type II	No.	7		
	(b) Accommodation for Engineer's junior staff				
	(ii) House Type III	No.	6		
	(ii) House Type IV	No.	13		
	(iii) House Type V	No.	13		
1.02	Maintain accommodation for Engineer's staff				
	(i) Type I	House-month	42		
	(ii) Type II	House-month	294		
	(iii) Type III	House-month	252		
	(iv) Type IV	House-month	546		
	(v) Type V	House-month	546		
1.03	Provide Engineer's office including provision of furniture, equipment and survey equipment as listed in the Special Specifications and the Appendix to this Item	L.sum	1		
1.04	Maintenance of Engineer's office, equipment, furniture and survey equipment	Mth	42		
1.05	Provide laboratory, including provision of furniture, equipment, and associated services as listed in the Appendix to this Item, for the Engineer and his staff.	L.sum	1		

BILL NO. 1 : PRELIMINARY AND SUPERVISORY/SUPPORT SERVICES					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1.06	Maintenance of Engineer's laboratory, furniture, equipment, and associated services.	Mth	42		
1.07	Provide with driver and maintain One (1) new 4WD Type 1 vehicles of minimum 4200 cc engine capacity naturally aspirated inclusive of the first 5000 kilometers travelled in any month	V. mth	42		
1.08	Extra Over Item 1.07 for Kilometers travelled in any month in excess of 5,000 for the vehicles provided in Item 1.07 for all running costs	km	36,000		
1.09	Provide with driver and maintain two (2) new 4WD Type 2 vehicles of minimum 3000 cc engine capacity turbo charged inclusive of the first 5000 kilometers travelled in any month	V. mth	84		
1.10	Extra Over Item 1.09 for Kilometers travelled in any month in excess of 5,000 for the vehicles provided in Item 1.09 for all running costs	km	72,000		
1.11	Provide with driver seven (7) new 4WD double cabin pickups of minimum capacity 2800cc engine capacity inclusive of the first 5000 kilometers travelled in any month	V. mth	234		
1.12	Extra Over Item 1.11 for Kilometers travelled in any month in excess of 5,000 for the vehicles provided in Item 1.11 for all running costs	km	315,000		
1.13	Provide with driver three (3) new 4WD single cabin pickups of minimum 2500cc engine capacity inclusive of the first 5000 kilometers travelled in any month	V. mth	102		
1.14	Extra Over Item 1.13 for Kilometers travelled in any month in excess of 5,000 km for the vehicles provided in Item 1.13 for and for all running costs	km	135,000		
1.15	Allow a provisional sum for removal and alteration of services including all activities required of the Contractor by Clause 121 of the Specifications	Prov. Sum	50,000,000	1	
1.16	Include percentage of Item 1.15 for the Contractor's overheads and profit	%	50,000,000		
1.17	Provide and maintain communication and radio call services to Engineer's office				
	(i) Mobile Radio	No.	14		
	(ii) Fixed radio system	No.	1		

BILL NO. 1 : PRELIMINARY AND SUPERVISORY/SUPPORT SERVICES					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1.18	Allow a provisional sum for internet connectivity charges for Engineer's Office and Laboratory	Prov. Sum	2,100,000	1	
1.19	EO Item 1.18 for the Contractor's profit and overheads	%	2,100,000		
1.20	Allow a provisional sum for land acquisition expenses as directed by the Engineer	Prov. Sum	20,000,000	1	
1.21	EO Item 1.20 for the Contractor's profit and overheads	%	20,000,000		
1.22	Allow provisional sum for off-road environmental mitigation measures to be used as directed by the Engineer. Item to be expended using the rates for other items in the bill of quantities which already contain contractors profit and overheads therefore no additional separate overheads and profit is applicable.	Prov.Sum	10,000,000	1	
1.23	Allow a provisional sum for the development of roadside stations and amenities.	Prov. Sum	550,000,000	1	
1.24	EO Item 1.23 for the Contractor's profit and over heads	%	550,000,000		
1.25	Allow a provisional sum for construction of access lanes and civil works to serve roadside markets. Item to be expended using the rates for other items in the bill of quantities which already contain contractors profit and overheads therefore no additional separate overheads and profit is applicable.	Prov. Sum	150,000,000	1	
1.26	Provision and implementation of Contractor's Environment and Social Management Plan (C-ESMP), in accordance with the Particular Conditions of Contract Sub-Clause 4.1, that includes the agreed Management Strategies and Implementation Plans including payment of NEMA licence	L.Sum	1		
1.27	Allow a provisional sum of KShs 2.5 million for Video Coverage and processing of digital pictures of the Progress of Works	Prov. Sum	2,500,000	1	
1.28	E.O. Item 1.27 for the Contractor's overheads and profit	%	2,500,000		
1.29	Allow a provisional sum of 2,000,000 for purchase of additional Testing and other equipment	Prov. Sum	2,000,000	1	
1.30	EO Item 1.29 for the Contractor's profit and overheads	%	2,000,000		

BILL NO. 1 : PRELIMINARY AND SUPERVISORY/SUPPORT SERVICES					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1.31	Provide 150 mm dia Solar powered tube well upto sweet water aquifer with pumping arrangements and 4,000 litre overhead storage for construction water and nearby habitants and hand over to PMU on completion of works in working conditions.	No.	15		
1.32	Allow a provisional sum of 40,000,000 for provision of armed security throughout the duration of the contract as will be directed by the resident engineer	Prov. Sum	40,000,000	1	
1.33	Include percentage of item 1.32 for contractors overheads and profits	%	40,000,000		
1.34	Allow a provisional sum for payment of Dispute Board (Employers portion of Dispute Board payment)	Prov. Sum	8,000,000	1	
1.35	E.O. Item 1.34 for the Contractor's overheads and profit	%	8,000,000		
1.36	Provide and maintain performance security as required in the conditions of contract	month	45		
1.37	Provide and maintain insurances as stipulated in the conditions of contract				
	(a) for works and contractors equipment in accordance with Sub Clause 18.2 of the General Conditions	month	33		
	(b) insurance against injury to persons and damage to property	month	45		
	(c) insurance for contractors personnel	month	45		
1.38	Allow a Provisional Sum of KShs. 10 Million for CPD training of Employer's counterpart staff from KeNHA and for payment of training allowances to Engineering trainees and attaches deployed for on-site training	Prov. Sum	10,000,000	1	
1.39	E.O. Item 1.38 for the Contractor's overheads and profit	%	10,000,000		
	Total Carried Forward to summary				

BILL No 4 : SITE CLEARANCE AND TOPSOIL STRIPPING

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<p><u>IMPORTANT NOTE</u></p> <p>All costs and charges connected with haulage are to be included within the unit rates entered against the items described in this Bill of Quantities</p> <p><u>Site Clearance</u></p> <p>Clear site on road reserve including removal of trees, hedges, bushes, and other vegetation or deleterious organic material, and back filling of holes left by removal of the specification, as follows:</p> <p><u>Topsoil Stripping</u></p> <p>Remove topsoil on the roadway, junctions and accesses to an approved depth and cart away to spoil or stock pile for re-use as directed by the engineer (Average depth = 200mm)</p> <p><u>Removal of existing structures</u></p> <p>Excavate, remove and dispose of or stockpile existing Armco pipe culverts of any diameter, including outlet and inlet structures as will be directed by the Engineer</p> <p>Excavate, remove and dispose of or stockpile existing concrete pipe culverts of any diameter, including outlet and inlet structures as will be directed by the Engineer</p> <p>Demolish, remove, and dispose of, existing reinforced concrete box culverts of any number of cells and any size, within the road reserve, including inlet and outlet structures as directed by the Engineer</p> <p>Excavate, remove and dispose of or stockpile existing drifts of any size, within the road reserve, including outlet and inlet structures as directed by the Engineer</p> <p>Allow provisional sum for removal of other structures and obstructions</p>				
4,01		Ha	180		
4,02		m ³	190,000		
4,03		m	200		
4,04		m	1400		
4,05		No.	16		
4,06		No	18		
4,07		Prov sum	5,000,000	1	
TOTAL FOR BILL 4 C/F TO SUMMARY					

BILL No 5 : EARTHWORKS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<u>Fill in Soft Material</u>				
5,01	Excavate from borrow, transport over any distance and fill in the embankment soft material, including watering and compaction	m ³	1,350,754		
	<u>Improved Sub Grade</u>				
5,02	Excavate material, transport over any distance lay, water and compact improved sub grade	m ³	178,848		
	<u>Fill in Hard Material</u>				
5,03	Excavate, transport over any distance and fill in hard material	m ³	125,475		
	<u>Spoil in Soft Material</u>				
5,04	Excavate, transport over any distance and stockpile for re-use or spoil in soft material	m ³	154,888		
	<u>Spoil in Hard Material</u>				
5,05	As Item 5.04 but in hard material	m ³	15,489		
	<u>Scarification and Compaction</u>				
5,06	Scarify, water and compact existing ground	m ³	102,092		
5,07	Scarify and compact existing upper 300mm below formation in cut,	m ³	99,360		
5,08	Compaction of sub grade of upper 300mm below formation in fill	m ³	205,675		
5.09	Allow a provisional Sum for miscellaneous landscaping	Prov sum	2,500,000	1	
TOTAL FOR BILL 5 C/F TO SUMMARY					

BILL No 7 : EXCAVATION AND FILLING FOR STRUCTURES

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<u>Box Culverts and Bridges</u>				
	<u>Excavation</u>				
7.01	Excavate in soft material to any depth, backfill and compact or cart to spoil excavated material; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	14,575		
7.02	Extra over item 7.01 above for excavation in hard material	m ³	1,458		
	<u>Selected Granular Fill Material</u>				
7.03	Provide, haul as necessary and backfill; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	7,823		
	<u>Selected Porous Filter Material</u>				
7.04	Provide, haul as necessary and backfill; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	2,541		
	<u>Stone Pitching</u>				
7.05	200mm thick dry stone pitching	m ²	40,000		
7.06	Extra over Item 7.05 for grouting to stone pitching	m ²	40,000		
	<u>Excavation for Gabions</u>				
7.07	Excavate in soft material to any depth, compact the surfaces to receive the gabions	m ³	6,270		
7.08	Extra over Item 7.07 for excavation in hard material	m ³	1,045		
	<u>Gabion mesh for boxes and mattresses</u>				
7.09	Provide and fix gabion mesh for boxes and mattresses, including diaphragms	m ²	192,000		
	<u>Rockfill to Gabions</u>				
7.10	Provide, haul over any distance and place rockfill to gabion boxes and mattresses	m ³	32,000		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Carried Forward				
	Brought Forward				
7.11	<u>Concrete class 15/20 to gabions</u> Provide 50mm thick concrete class 15/20 to exposed surfaces of the gabion boxes and mattresses	m ³	3,000		
7.12	<u>Geotextile Filter Fabric</u> Provide and place geotextile filter fabric (as terram 280g/m ² or similar approved)	m ²	3,000		
7.13	<u>Excavate and fill for soft spots and voids</u> Excavate as instructed, provide all materials and backfill concrete class 15/40 in soft spots and voids below foundations	m ³	231		
7.14	Water proof paper to be used under concrete slabs and foundation	m ²	3,848		
7.15	Rip Rap for embankment protection	m ³	3,000		
TOTAL FOR BILL 7 C/F TO SUMMARY					

BILL No 8 : CULVERTS AND DRAINAGE WORKS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<i>Note: No separate payments shall be made for gravel for blinding or cart to spoil of unsuitable excavation material and the cost of such shall be included in rates and prices entered</i>				
8,01	<u>Excavate for Culverts and Subsoil Drains in Soft Material</u> Excavate for culverts and subsoil drains in soft material	m ³	6,762		
8,02	E.O. item 8.01 for excavation in hard material	m ³	676		
8,03	<u>Excavate for Minor Drainage Structures in Soft Material (Provisional)</u> Excavate for minor drainage structures in soft material, compaction of the invert of the excavation and backfilling of the excavated material or removing the excavated material to spoil	m ³	1,283		
8,04	E.O. item 8.03 for excavation in hard material	m ³	128		
8,05	<u>Excavate for Inlet, Outfall, Mitre and Catchwater Drains in Soft Material</u> Excavate for inlet, outfall, mitre and catch water drains in soft material and disposal of excavated material to spoil	m ³	8,000		
8,06	E.O. item 8.05 for excavation in hard material	m ³	200		
8,07	<u>Selected Backfill Material</u> Provide, haul as necessary and backfill to any depth selected material; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	1,610		
8,08	<u>Rockfill Below Culverts</u> Provide and place rockfill below culverts	m ³	518		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
8,09	<u>Provide, Lay and Joint Pipes</u> Provide, lay and joint pipes				
	(a) 1,200mm diameter	m	700		
	(b) 900mm diameter	m	2,520		
	(c) 600mm diameter	m	800		
8,10	<u>Concrete class 15/20 to Beds, Sorrounds and Haunches</u> Provide and place concrete class 15/20 to beds, surrounds and haunches; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	2,700		
8,11	<u>Concrete class 25/20 to Headwalls, Wingwalls, Aprons, Toe Beams and other Drainage Structures</u> Provide and place concrete class 25/20, including reinforcement and shuttering; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	750		
8,14	<u>Earth Cut off Banks (Provisional)</u> Construct earth cut-off banks adjacent to culverts as instructed by the Engineer	m ³	2,100		
8,15	<u>Concrete Scour Checks</u> Construct stone pitched scour checks type "B" to culvert outfall locations as shown in the drawings; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	320		
8,16	Construct precast concrete scour checks type "A" to culvert outfall locations, and include for concrete bed and sorround as shown in the drawings; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	320		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
8,17	<u>Cast in situ Concrete Drain Ditch (Provisional)</u> Excavate and cast in-situ covered concrete drain ditch as shown in the drawings; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	200		
8,18	<u>Cast in-situ Concrete Chutes on High Fills (Provisional)</u> Excavate, provide materials and cast in-situ covered concrete chutes on high fills as shown in the drawings; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	200		
8,19	<u>Cast in-situ Concrete Channels (Provisional)</u> Excavate, provide materials and cast in-situ concrete channels in concrete class 20/20, including A142 BRC mesh reinforcement as shown in the drawings; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	200		
8,20	<u>Selected Granular Fill Material</u> Providing, hauling as necessary and backfilling to any depth selected granular fill material; all in accordance with the specifications and in conformity with the Engineer's instructions	m ³	715		
8,21	<u>Invert Block Drains (Provisional) - Invert Block Type "B"</u> Provide and place invert block drains with two course side slabs including bedding and backfilling with selected material; all in accordance with the specifications and in conformity with the Engineer's instructions	m	4500		
8,22	<u>300mm diameter Half Round Concrete Channels (Provisional)</u> Excavate in soft material, provide and joint 300mm diameter half round concrete channels on 75mm gravel blinding with 150mm concrete haunch to parking areas	m	660		
TOTAL FOR BILL 8 C/F TO SUMMARY					

BILL No 9 : PASSAGE OF TRAFFIC

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
9,01	<u>Construction of Deviations in maximum lengths of 10km sections</u> Construct and maintain (including watering) 8.0 m wide deviations in 10km sections; all in accordance with the specifications	km	45		
9,02	<u>Spot Gravel Wearing Course</u> Provision, laying and compaction of gravel wearing course to deviations, 8m wide, 150mm thick, where directed by the Engineer	m ³	54,000		
9,03	<u>Temporary Traffic Signs and Barriers on Deviation Roads</u> Provide, erect and maintain temporary signs, barriers, lights on the deviation roads; all in accordance with the specifications and as instructed by the Engineer	km	45		
9,04	<u>Maintenance of existing road</u> Allow for maintenance, grading and spot gravelling ahead of the works all in accordance with the specifications	Lump Sum	1		
9,05	Subtract (deduct) penalty amount for each day when the Resident Engineer certifies that the existing road or the diversion have not been maintained in the condition in which they were after first being improved under this bill.	Day	0	(75,000)	
TOTAL FOR BILL 9 C/F TO SUMMARY					

BILL No 12 : NATURAL MATERIAL FOR SUB BASE AND BASE

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
12,01	<u>Natural Gravel Sub Base and Base (Base Quality)</u> Provide, transport over any distance, place and compact, natural gravel sub base and base to carriageway, shoulders, junctions, accesses, parkings, etc; all in accordance with the specifications or as directed by the Engineer	m ³	134,000		
TOTAL FOR BILL 12 C/F TO SUMMARY					

BILL No 13 : GRADED CRUSHED STONE SUBBASE AND BASE

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
13,01	<u>Graded Crushed Stone for Sub-Base</u> Provide, crush, grade, mix, transport over any distance, place and compact, graded crushed stone sub base and base; all in accordance with the specifications or as directed by the Engineer	m ³	108,500		
TOTAL FOR BILL 13 C/F TO SUMMARY					

BILL No14 : CEMENT AND LIME TREATED MATERIAL

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
14,01	<u>Lime Treated Materials - Natural Gravel for Subbase</u> Provide and spread Lime stabilizer to natural gravel sub base; all in accordance with the specifications and in conformity with the Engineer's instructions	tonne	2,680		
14,02	<u>Cement Treated Materials - Natural Gravel for Subbase</u> Provide and spread cement stabilizer to natural gravel sub base; all in accordance with the specifications and in conformity with the Engineer's instructions	tonne	9,380		
14,03	<u>Cement Treated Materials – Graded crushed stone for Base</u> Provide and mix cement stabilizer to graded crushed stone for base; all in accordance with the specifications and in conformity with the Engineer's instructions	tonne	5,177		
14,04	<u>Mix in improvement agents to subbase and base</u> Mix-in cement or lime improvement agent into natural gravel for sub base using a road recycler/pulvimixer	m ³	134,000		
14,05	Mix-in cement improvement agent into graded crushed stone base using a stationery mixing plant (pugmill)	m ³	108,500		
14,06	<u>Curing and Maintenance of Treated Materials</u> Water and maintain curing system for the treated material; all in accordance with the specifications and as directed by the Engineer	m ²	1,141,030		
TOTAL FOR BILL 14 C/F TO SUMMARY					

BILL No 15 : BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
15,01	<u>K1-70 Tack Coat</u> Provide, heat and spray K1-70 tack coat on roadway, walkways, junctions and accesses; all in accordance with the specifications and as directed by the Engineer (0.5 - 0.8L/m ²)	Litre	400,000		
15,02	<u>Prime Coat</u> Prepare surface, provide, heat and spray MC-30 prime coat to carriageway, shoulders, footways, junctions and accesses; all in accordance with the specifications and as directed by the Engineer. (0.8-1.2 L/m ²)	Litre	675,000		
15,03	<u>80/100 Pen Bitumen as Binder</u> Provide, heat, cut and spray 60/70 Pen. grade bitumen as binder for any seal; all in accordance with the specifications and as directed by the Engineer. (0.6 – 1.4 L/m ²)	Litre	1,061,000		
15,04	<u>14/20mm Precoated Chippings</u> Provide, transport, lay and roll 14/20 mm class 1 chippings all in accordance with the specifications and as directed by the Engineer. (Typical spread rate 70-80 m ² /m ³)	m ³	8,500		
15,05	<u>10/14mm Precoated Chippings</u> Provide, transport, lay and roll 10/14 mm class 1 chippings all in accordance with the specifications and as directed by the Engineer. (Typical spread rate 80-100 m ² /m ³)	m ³	1,600		
15,06	<u>6/10mm Precoated Chippings</u> Provide, transport, lay and roll 6/10 mm class 1 chippings all in accordance with the specifications and as directed by the Engineer. (Typical spread rate 110-130 m ² /m ³)	m ³	5,100		
15,07	Provide and add approved adhesion agent to bitumen binder (prov)	Litre	12,000		
TOTAL FOR BILL 15 C/F TO SUMMARY					

BILL No16: BITUMINOUS MIXES

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
16,01	Provide, lay and compact 75 mm thick Dense Bitumen Macadam (Superpave) binder course on carriageway, all in accordance with the specifications and as directed by the Engineer	m ³	27,300		
16,02	Provide, lay and compact 35 mm thick Asphalt Concrete (Superpave) on shoulders, all in accordance with the specifications and as directed by the Engineer	m ³	7,100		
TOTAL FOR BILL 16 C/F TO SUMMARY					

BILL No17: CONCRETE WORKS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<p><u>Box Culverts and Bridges</u></p> <p><u>The rates provided herein shall include the provision of all formwork, scaffolding, falsework, cofferdams, balloons, surface finishes, protection works e.t.c as specified in the specifications or instructed by the RE</u></p>				
17.01	<p><u>Concrete class 15/40 for Blinding to Structures</u></p> <p>Provide and haul all materials, prepare, handle and place concrete class 15/40 for blinding; all in accordance with the specifications and in conformity with the Engineer's instructions</p>	m ³	968		
17.02	<p><u>Concrete class 25/20</u></p> <p>Provide and haul all materials, prepare, handle and place concrete class 25/20; all in accordance with the specifications and in conformity with the Engineer's instructions</p>	m ³	9,955		
17.03	<p><u>Concrete class 30/20 for Bridge works</u></p> <p>Provide and haul all materials, prepare, handle and place concrete class 30/20 for bridge structures; all in accordance with the specifications and in conformity with the Engineer's instructions</p>	m ³	14,311		
17.04	<p><u>Concrete class 40/20</u></p> <p>Provide and haul all materials, prepare, handle and place concrete class 40/20 in elastomeric bearing plinths; all in accordance with the specifications and in conformity with the Engineer's instructions</p>	m ³	42		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
17.06	<u>Heavy Duty PVC Pipes</u> Supply, and fix heavy duty PVC pipes of the following dimensions; all in accordance with the specifications and in conformity with the Engineer's instructions (b) 75mm diameterx300mm long in weep holes of culverts	No.	20		
17.07	<u>Reinforcement</u> Supply, cut, shape, bend and place reinforcement of the following sizes; all in accordance with the specifications and in conformity with the Engineer's instructions (a) High yield steel reinforcing bars to BS 4461 diameter less than or equal to 16mm (b) As Item 17.09(a) above but diameter exceeding 16mm	t	1,997		
		t	1,100		
TOTAL FOR BILL 17 C/F TO SUMMARY					

BILL No 20: ROAD FURNITURE

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
20,01	<u>Kilometre marker posts</u> Provide and erect kilometre posts as shown in the contract drawing	No	30		
20,02	<u>Edge marker posts</u> Provide and erect edge marker posts as shown in the contract drawing and concreting with concrete class 15/20	No	180		
20,03	<u>Warning signs</u> Provide, excavate for and erect warning signs, including backfill				
	(a) 450 x 900 mm size	No	25		
	(b) 600 mm size - Provisional	No	6		
	(c) 750 mm size	No	24		
	(d) 1000 mm size - Provisional	No	8		
20,04	<u>Priority signs</u> Provide, excavate for and priority signs, including backfill and concreting with concrete class 15/20 to base				
	(a) 750 mm size	No	6		
	(b) 1000 mm size	No	14		
20,05	<u>Prohibitory signs</u> Provide, excavate for and erect prohibitory signs diameter 600mm, including backfill and concreting with concrete class 15/20 to base	No	22		
20,06	<u>Standard informatory signs - All Provisional</u> Provide, excavate for and erect information signs, including backfill and concreting with concrete class 15/20 to base				
	(a) 400 mm x 300 mm size	No	10		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
20,07	(b) 500 mm x 600 mm size (c) 600mm x 600mm Non-Standard informatory signs (Provisional) Provide, excavate for and erect information signs, including backfill and concreting with concrete class 15/20 to base	No	5		
		No	14		
	(a) Non-Standard informatory signs less than 1m ²	No	14		
	(b) As Item 20.07 (a) but equal or more than 1m ² but less than 2 m ²	No	2		
	(c) As Item 20.12 (a) but equal or more than 2m ² but less than 5 m ²	No	2		
	(d) As Item 20.12 (a) but equal to or more than 5m ² - Provisional	No	2		
20,08	<u>Mandatory signs</u> Provide, excavate for and erect mandatory signs, including backfill and concreting with concrete class 15/20 to base	No	10		
20,09	<u>Road marking in thermoplastic paint</u> Prepare road surface, supply approved tack coat and road thermoplastic paint, spray approved tack coat, mark out and paint				
	(a) White paint	m ²	14,100		
	(b) Yellow paint	m ²	4,600		
20,10	<u>Reflective road studs (cat's eyes)</u> Provide, transport, handle and place approved reflective road studs	No	8,700		
20,12	<u>Road humps and rumble strips</u> Provide material, transport and construct road humps and rumble strips	m	350		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
20,13	<u>Concrete road Kerbs</u> Provide material, transport, handle, mix and place (a) Raised straight precast kerbs 130mmx220mm	m	3,000		
20,14	<u>Channel blocks</u> Provide, lay and joint 125 x 100mm channel blocks to roads, footpaths and shoulders	m	3,000		
20,15	<u>Quadrants</u> Provide and lay quadrants of radius less than 1.0m				
20,16	<u>P.c.c bollards - Provisional</u> Provide and erect p.c.c bollards.	No.	100		
20,17	<u>Guardrails</u> (a) Provide, transport materials, post, excavate, erect flexbeam guardrails	m	6,500		
20,19	<u>Service ducts</u> Provide all materials and construct 100mm PVC ducts under road	m	1200		
20,20	<u>Ducts marker posts</u> Provide duct marker posts in accordance with the drawings	No	80		
20,21	<u>Culvert marker posts</u> Provide and erect culvert marker posts	No	230		
20,24	<u>Road Reserve Boundary posts</u> Provide and erect road reserve boundary posts including painting and lettering	No	1,600		
20,25	<u>Raised Zebra Crossings</u> Provide all material, lay and construct raised zebra crossing	No.	15		
TOTAL FOR BILL 20 C/F TO SUMMARY					

BILL No 21: MISCELLANEOUS BRIDGEWORKS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	<u>Miscellaneous Bridgeworks</u>				
21.01	<u>WaterProofing to Structures</u> Apply two coats of bituminous water-proofing paint to backs of abutments and wing walls	m ²	3,344		
21.02	<u>Bridge Bearings</u> Provide, fit and fix in position true to line and level complete with all accessories as per the specification and as directed by the Engineer				
	Provide 300x300x50mm thick elastomeric bearings	No	60		
	Provide 450x450x50mm thick elastomeric bearings	No	180		
21.03	<u>Weepholes</u> Provide and cast 1.1m long 75mm diameter Class C PVC drainpipe to deck slab at both kerbs at 3000mm c/c (max)	No	352		
21.04	Provide and fix 150mm dia PVC service ducts on bridge deck as per the drawings	m	60		
21.05	Provide balustrade of ARMCO flex beam and 50mm diameter galvanized steel pipe handrail with 124x75x8mm rectangular hollow section (RHS) support posts @ 2000mm c/c anchored in deck side beams	m	660		
21.06	Provide balustrade of ARMCO flex beam with 124x75x8mm rectangular hollow section (RHS) support posts @ 2000mm c/c bedded in shoulders	m	209		
21.07	750mm long 25mm diameter mild steel bolts properly grouted to receive deck girders	No	244		
21.08	75x75x8mm Equal Angles with steel anchors @ 1000mm c/c	m	85		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
21.09	25mm thick mastic joint filler	m ²	56		
21.1	25x10mm polysulphide joint sealant	m	67		
21.11	Provide 50mm diameter handrail pipe with 100x100x12mm plate welded to the rod @1000mm max	Lm	431		
21.12	Provide 250x250x6mm plate embedded in concrete and welded to plate @1000mm max	NR	431		
21.13	Provided 3No. 150mm diameter service pipes to sides of slab within the walkway	LM	1,335		
21.14	750mm long 25mm diameter mild steel bolts properly grouted to receive deck girders	NR	140		
21.15	Provide 50x50x2.5mm RHS pipe as guard rail on both sides of ramp, stair and foot bridge @600mm welded as shown in the drawings	LM	350		
TOTAL FOR BILL 21 C/F TO SUMMARY					

BILL No 22: DAY WORKS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	PLANT AND EQUIPMENT The rates included herein are to include all operational and maintenance costs, fuel, oil, grease, operator charges, wages, supervision, overheads and profits. Only time employed upon the work will be measured and the rates shall include for idle time spent travelling and overtime in accordance with clause 2202(a) of the specifications. All items of the plants must be priced				
22,01	Crawler dozer with hydraulic ripper attachment a - 100-135 kw rated flywheel power b - 136-185 kw rated flywheel power c - 186-250 kw rated flywheel power	hr hr hr	400 400 400		
22,02	deleted				
22,03	Mortor graders complete with scarifier a - 80 -110 kw rated flywheel power b - 111-120 kw rated flywheel power c - 121-160 kw rated flywheel power	hr hr hr	400 400 400		
22,04	Rollers - Towed Vibratory Including Tractor a - 6.5 - 8.8t unballasted weight b - 8.9 - 11.7t unballasted weight	hr hr	400 400		
22,05	Rollers - Road Deadweight (Steel three wheel) a - 6.1 - 8.5t unballasted weight b - 8.6 - 10.5t unballasted weight	hr hr	400 400		
22,06	Rollers - Rubber Tyred Self-Propelled a - upto 1.0t per wheel b - 1.1 - 2.0t per wheel	hr hr	400 400		
22,07	Rollers - Vibratory Single Roll Rubber Tyred a - 8.3 - 10.5t unballasted weight	hr	400		
22,08	Rollers - Vibratory Pedestrian Operated Twin Roller a - 651kg - 1.3t unballasted weight	hr	400		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
22,09	Vibrating Plate Compactor a - 114kg - 200kg operating weight	hr	1000		
22,10	Compressor rated by normal delivery of free air per min at about 7kg/cm², complete with all tools, hoses, steel etc a - 6.0 - 7.4m ³ /min b - 7.5 - 19.7m ³ /min c - 19.8 - 25.5m ³ /min	hr hr hr	400 400 400		
22,11	Cranes - Mobile Rubber Tyred Rough Terrain Type a - 23.0 - 40.0t max working load	hr	200		
22,12	Cranes - Excavator Cranes Tracked a - 20.0 - 28.0t max working load b - 28.1 - 36.0t max working load c - 26.1 - 56.0t max working load	hr hr hr	100 100 100		
22,13	Small dumpers a - 750-1000kg maker's rated payload	hr	400		
22,14	Excavator - hydraulic crawler or wheel mounted, full circle slew (back actor) a - 14.0 - 17.0 t nominal weight of machine	hr	400		
22,15	Excavators - hydraulic wheeled dual purpose (backhoe loader) a - 0.6 - 0.8 m ³ rated bucket capacity b- 0.81 - 1.0 m ³ rated bucket capacity	hr hr	400 400		
22,16	Pumps (inclusive of all hoses); a - 50 - 76mm delivery b - 77 - 101mm delivery	hr hr	1000 1000		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
22,17	Tractors - Rubber Tyred Including Trailer a - 50 - 76kw rated flyhweel power	hr	400		
	Loaders The basis of loader classification is the society of Automotive Engineers of America (SAE) rated capacity of the bucket. The classification is based on the largest general purpose bucket by the manufacturer or the bucket size adopted by the Contractor which is approved by the Engineer.				
22,18	Wheel Loaders - 4 wheel drive, articulated; a - 1.5 -2.00m ³ SAE rated capacity	hr	400		
	b - 2.01 -3.40m ³ SAE rated capacity	hr	400		
	c - 3.41 -5.35m ³ SAE rated capacity	hr	400		
22,19	Crawler Loaders; a - 0.8 - 1.30m ³ SAE rated capacity	hr	400		
	b - 1.31 - 1.90m ³ SAE rated capacity	hr	400		
	c - 1.91 - 2.5m ³ SAE rated capacity	hr	400		
22,20	Concrete Mixers (wet capacity) a - upto 100 litres	hr	400		
	b - 151 - 200 litres	hr	400		
	c - 201 - 300 litres	hr	400		
22,21	Diesel Concrete vibrator - Poker Type	hr	400		
22,22	Lorries - Ordinary a - upto 7.5 t gross vehicle weight	hr	1000		
	b - 7.6 - 12.0 t gross vehicle weight	hr	1000		
22,23	Lorries - Tipper a - upto 11.0 t gross vehicle weight	hr	1000		
	b - 11.1 - 17.0 t gross vehicle weight	hr	1000		
	c - 17.1 - 25.5 t gross vehicle weight	hr	1000		
22,24	Van, Pick-up or Similar Utility Vehicle a - upto 1.0 t carrying capacity	hr	1000		
	b - 1.11 - 2.66 t carrying capacity	hr	1000		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
22,25	Water or Fuel Tanker - Self Propelled				
	a - 3500 - 4550 litre capacity	hr	400		
	b - 4551 - 7000 litre capacity	hr	400		
	c - 7001 - 12000 litre capacity	hr	8,000		
22,26	Pressure Bitumen Distributor				
	a - 3500 - 4500 litre capacity	hr	400		
	b - 4501 - 9000 litre capacity	hr	400		
22,27	Tipper (dump) truck				
	a - 10-15 tonne gross weight	hr	400		
	b - 16-25 tonne gross weight	hr	400		
22,28	Mechanical bitumen hand sprayer	hr	400		
22,29	Chipps Spreader				
	Self-propelled chip spreader or equivalent	hr	400		
22,30	Asphalt Paver				
	Self-propelled asphalt paver	hr	400		
22,31	Mechanical broom	hr	400		
22,32	Pulvi-mixer	hr	400		
22,33	Labour:				
	Note: The rate included herein shall include all costs of labour, as well as overtime, travelling time and cost of accomodation, social security contributions, use and maintenance of small tools of trade, supervision insurance, overheads, profits and any other costs.				
	a - Labourer	hr	5600		
	b - Artisan	hr	2800		
	c - Plant Operator	hr	2800		
	d - Driver	hr	2800		
	e - Foreman	hr	2800		
	f - Site Surveyor	hr	2800		
	Carried Forward				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	Brought Forward				
	<u>MATERIALS</u> All items of materials must be priced in accordance with the requirements of clause 2202 © of the specifications				
22,34	Shuttering timber				
	a - Class F1 finish	m ²	700		
	b - Class F2 finish	m ²	350		
	c - Class F3 finish	m ²	350		
22,35	Mild steel				
	a - Upto and including 16 mm diameter	ton	50		
	b - Over 16 mm diameter size	ton	25		
22,36	High yield steel				
	a - Upto and including 16 mm diameter	ton	50		
	b - Over 16 mm diameter size	ton	25		
22,37	Ordinary Portland Cement				
	a - Ordinary Portland Cement	ton	35		
22,38	Hydrated Lime				
	a - Hydrated Lime	ton	35		
22,39	Aggregates for Concrete				
	a - fine	ton	40		
	b - course	ton	20		
22,40	Bitumen and Emulsions				
	a - MC-70	ltrs	4,000		
	b - 80/100	ltrs	4,000		
	c - K1-70	ltrs	4,000		
22,41	Chippings				
	a - class 3, nominal size 10/14	ton	11		
	b - class 3, nominal size 3/6	ton	4		
22,42	Gabion mesh				
	(2.0 x 1.0 x 1.0m)	m ²	1,400		
22,43	Rock fill to gabions	m ³	300		
22,44	Pentolite stick explosive or equivalent	kg	35		
22,45	Explosive fuse	m	175		
22,46	Detonating relay	No.	21		
TOTAL FOR BILL 22 C/F TO SUMMARY					

BILL No 23: STREET LIGHTING

BILL No 23. LED STREET LIGHTING					
Item No	DESCRIPTION	QTY	UNIT	RATE KSHS	AmountKSHS.
	Supply, deliver, install and set to work the following with all accessories as specified: - The Contractor should include in his rates the cost for 3months electricity bills arising from street light test-runs including approved KPC service, liaison and attendance charges as well as compliance with provisions of special specifications.				
	<u>12 metre Streetlighting installation</u>	-		-	-
23.1	12m concrete streetlighting column made from Concrete complete with a double arm straight entry bracket as shown on the drawing	20	No.		
23.2	12m concrete streetlighting column made from concrete complete with a single arm side entry bracket of 1.5m outreach as shown on the drawing	200	No.		
23.3	25Amp single phase cut-out complete with a 5A HRC fuse.	20	No.		
23.4	137W ultra High power LED streetlights which should be engraved to Ministry of Roads and Public Works standard codes to be provided	240	No.		
23.5	1.5mm ² twin with earth PVC insulated copper cable	5000	m		
23.6	Metal control pillar as shown on the drawing, with locable facility for single phase service line	20	No.		
23.7	(a) 4 way surface mounted Consumer unit with a 100 Amps DP integral isolator.	15	No.		
a	(b) 6 way surface mounted Consumer unit with a 100 Amps DP integral isolator.	2	No.		
b	(c) 10 Amp single phase MBC's for item No. 23A.07	40	No.		
23.8	Blanking plates for item No. 23A.07 above	40	No.		
23.9	40Amp current operated earth leakages circuit breaker with rated leakage current of 0.5A.	20	No.		
23.10	40Amp Double pole contactor.	20	No.		
23.11	Photo cell kit, Photo cell socket and bracket.	20	No.		
23.12	4.6m steel column for mounting item No.23A.11 above	20	No.		
23.13	2 core 10.0mm ² PVC/SWA/PVC Cu cable	8000	m		
23.14	Earthing comprising of a 6mm ² earth lead and 1800mm long by 15mm diameter copper earth electrode with a driving tip and clamp in a 300mm by 300mm by 300mm concrete manhole with removable cover	20	No.		
23.15	Trenching, shifting, cable laying, tiling with concrete surround.	8000	m		
23.16	Cable glands for terminating underground cables	500	No.		
23.17	1.5mm ² 3 core PVC/SWA/PVC copper cable for terminating Photo cell	20	m		
23.18	UPVC ducts for carrying the service lines and cables across the road, to have concrete surround of 100mm	100	m		
Total of Bill No 24 carried forward to next page					

Item	DESCRIPTION	QTY	UNIT		
	Total Brought forward				
	<u>20 metre streetlighting high mast installation</u>				
23.19	20m steel galvanised streetlighting column made from Class "B" steel galvanised pipe complete with a double arm side entry bracket of 1.5m outreach as per drawing	3	No.		
23.20	Three phase 25Amp cut-out complete with a 10A HRC fuse.	3	No.		
23.21	180W ultra High power LED flood lights which should be engraved to Ministry of Roads and Public Works standard codes to be provided State make and cat No.	12	No.		
23.22	1.5mm ² twin with earth PVC insulated copper cable from the cutout unit to the lighting fittings.	150	m		
23.23	Metal control pillar as shown on the drawing, with locable facility for three phase service line.	3	No.		
23.24	4 way surface mounted distribution boards with a 100 Amps DP integral isolator.	3	No.		
23.25	(a) 20Amp 3 phase MCB's for item No. 6 above	3	No.		
23.26	(b) 15Amp single phase MCB 's for item No. 6 above	6	No.		
23.27	Blanking plates for item No. 6 above	6	No.		
23.28	40Amps TPN current operated earth leakages circuit breaker with rated leakage current of 0.5A.	3	No.		
23.29	40Amp TPN contactor.	3	No.		
23.30	Photo cell kit, Photo cell socket and bracket	3	No.		
23.31	4.6m steel column for mounting item No. 11 above	3	No.		
23.32	(a) 10.0mm ² 4 core PVC/SWA/PVC Cu cable	300	m		
23.33	Earthling comprising of a 6mm ² earth lead and 1800mm long by 15mm diameter copper earth electrode with a driving tip and clamp in a 300mm by 300mm concrete manhole with removable cover	3	No.		
23.34	Trenching, shifting, cable laying, tiling and backfilling.	300	m		
23.35	Cable glands for terminating underground cables.	6	No.		
23.36	1.5mm ² 3 core PVC/SWA/PVC copper cable for terminating Photo cell.	40	m		
23.37	63Amp TPN MCB with enclosure type Crabtree or equivalent	3	No.		
	Total of Bill № 23 carried forward to summary				

BILL No 24: MISCELLANEOUS BRIDGE PILING WORKS

BILL NO. 24: MISCELLANEOUS BRIDGE PILING WORKS					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Provide all equipment and cast insitu piles as shown on drawings or as directed by engineer. The rates quoted shall include for pile steel reinforcement as shown on drawings, all other incidentals required for piling as well as provision of concrete class 30/20 , including compaction as required. Standing time for the rig shall be included in the rates.				
24.01	Mobilisation of Piling equipment to and removal from site after completion	L.Sum	1		
24.02	Form in positions shown on drawings, "cast insitu" vertical piles of 750 mm nominal shaft dia. with 900 mm nominal bulb dia. at base. Pile length not exceeding 10 m	m	1440		
24.03	As Item 24.02 but pile length exceeding 10m	m	2880		
24.04	As item 24.02 but piles of 450mm nominal shaft dia	m	240		
24.05	As item 24.03 but piles of 450mm nominal shaft dia	m	480		
24.06	Move piling rig and other equipment from one pile position to the other and set up for piling	L. Sum	1		
24.07	Allow for sets of projecting steel reinforcement 750 mm from top of cut off level in line with pile reinforcement	No.	168		
24.08	Allow for trimming piles to level and hooking reinforcement to shape	No.	168		
24.09	Allow for boring through obstructions such as material other than natural formations e.g. old foundations, boulders, boulders etc.	hr	200		
24.10	Test load first test pile, include for forming anchor piles, all equipment, staging, jacks, beams, straps test gauges and measuring instruments transport material etc. as specified in the special specifications	No.	4		
24.11	As Item 24.10 but for subsequent test piles	No.	4		
Total for Bill 24 carried to summary					

BILL No 25 : HIV/AIDS AWARENESS CAMPAIGN

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
25,01	Instituting an HIV/AIDS awareness campaign	month	42		
25,02	Instituting an HIV/AIDS prevention campaign	month	42		
25,03	Allow a provisional sum of Ksh 9,000,000 for HIV AIDS training	PC Sum	9,000,000	1	
25,04	Extra over item 25.03 for Contractor's profit and overheads	%	9,000,000		
TOTAL FOR BILL 25 C/F TO SUMMARY					

BILL No 26: ROAD SAFETY AWARENESS CAMPAIGN

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
26,01	Instituting a Road Safety Awareness Campaign	month	42		
26,02	Instituting an Accident Prevention Campaign	month	42		
26,03	Allow a Prime Cost Sum of Ksh 9,000,000 for Road Safety Training	pc sum	9,000,000	1	
26,04	Extra over item 26.03 for Contractor's profit and overheads	%	9,000,000		
TOTAL FOR BILL 26 C/F TO SUMMARY					

BILL NO. 27: OFF-ROAD AND PARKING BAYS					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Note: Other quantities have been included in the relevant bills				
27.01	Provide, lay and fix concrete paving blocks to walkways, including sand bed and joints, as directed by the Engineer	m ²	10,000		
27.02	Provide, place and compact the following classes of concrete as specified to Truck parking area				
	(a) Class 15/20 for blinding for bridges and box culverts	m ³	1,125		
	(b) Class 30/20 for substructures and Truck parking	m ³	4,500		
27.03	Provide, Lay and fix fabric mesh reinforcement A142 to mass concrete) to heavy parking areas	m ²	22,500		
27.04	Dowel bars size 32mm 470mm long as instructed and approved by the Engineer	no.	18,000		
27.05	Silicon or equal approved joint sealant as instructed and approved by the Engineer	m	18,000		
Total of Bill 27 carried forward to Summary					

Summary of Specified Provisional Sums

SUMMARY OF SPECIFIED PROVISIONAL SUMS AND PRIME COST SUMS					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1.15	Allow a provisional sum for removal and alteration of services including all activities required of the Contractor by Clause 121 of the Specifications	Prov. Sum	50,000,000	1	50,000,000
1.18	Allow a provisional sum for internet connectivity charges for Engineer's Office and Laboratory	Prov. Sum	2,100,000	1	2,100,000
1.20	Allow a provisional sum for land acquisition expenses as directed by the Engineer	Prov. Sum	20,000,000	1	20,000,000
1.22	Allow a provisional sum for off-road environmental mitigation measures to be used as directed by the Engineer	Prov. Sum	10,000,000	1	3,000,000
1.23	Allow a provisional sum for the development of roadside stations and amenities	Prov. Sum	550,000,000	1	550,000,000
1.25	Allow a provisional sum for construction of access lanes and civil works to serve roadside markets	Prov. Sum	150,000,000	1	150,000,000
1.27	Allow a provisional sum of KShs 2.5 million for Video Coverage and processing of digital pictures of the Progress of Works	Prov. Sum	2,500,000	1	2,500,000
1.29	Allow a provisional sum of 2,000,000 for purchase of additional Testing and other equipment	Prov. Sum	2,000,000	1	2,000,000
1.32	Allow a provisional sum of 40,000,000 for provision of armed security throughout the duration of the contract as will be directed by the resident engineer	Prov. Sum	40,000,000.00	1	40,000,000.00
1.34	Allow a provisional sum for payment of DB (Employers portion of DB payment)	Prov. Sum	8,000,000	1	8,000,000
1.38	Allow a Provisional Sum of KShs. 10 Million for CPD training of Employer's counterpart staff from KeNHA and for payment of training allowances to Engineering trainees and attaches deployed for on-site training	Prov. Sum	10,000,000	1	10,000,000
4.07	Allow a provisional sum for the removal of other structures and obstructions	Prov. Sum	5,000,000	1	5,000,000
5.09	Allow a provisional sum for miscellaneous landscaping	Prov. Sum	2,500,000	1	2,500,000
25.03	Allow a provisional sum for HIV/ AIDS Awareness campaign, Prevention and Training Camps	Prov. Sum	9,000,000	1	7,000,000
26.03	Allow a provisional sum for road safety training	Prov. Sum	9,000,000	1	5,000,000
	Total of specified provisional sums		870,100,000		870,100,000

GRAND SUMMARY OF BILLS OF QUANTITIES

BILL NO.	DESCRIPTION	AMOUNT (KSHS)
1	PRELIMINARY AND SUPERVISORY SERVICES	
4	SITE CLEARANCE AND TOP SOIL STRIPPING	
5	EARTHWORKS	
7	EXCAVATION AND FILLING FOR STRUCTURES	
8	CULVERTS AND DRAINAGE WORKS	
9	PASSAGE OF TRAFFIC	
12	NATURAL MATERIAL BASE AND SUBBASE	
13	GRADED CRUSHED STONESUBBASE AND BASE	
14	CEMENT AND LIME TREATED MATERIALS	
15	BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING	
16	BITUMINOUS MIXES	
17	CONCRETE WORKS	
20	ROAD FURNITURE	
21	BRIDGE WORKS	
22	DAY WORKS	
23	STREET LIGHTING	
24	MISCELLANEOUS BRIDGE PILING WORKS	
25	HIV/AIDS AWARENESS CAMPAIGN	
26	ROAD SAFETY AWARENESS CAMPAIGN	
27	OFF-ROAD AND PARKING BAYS	
A	SUB TOTAL OF BILLS	
B	Provisional and Prime Cost Sums Specified in the Bills	870,100,000
C	Sub-Total of Bills less Provisional & Prime Cost Sums Specified in the Bills	
D	Add 10% of (C) for Contingencies to be Expended in part or deleted entirely by the Engineer in accordance with Clause 13 of the Conditions of Contract	
E	Add 12.5% of (C) for Price Adjustment in accordance with Clause 13.8 of the Conditions of Contract	
F	Subtotal F = A + D + E	
G	Add 16% of subtotal F for Value Added Tax	
H	Bid Price (=F+G)	

APPENDIX TO BILL ITEM 1.03

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A103/1.00	Construct and maintain the RE'S office for the entire contract period, rate includes the building, security, water, electricity, gas, cleaning, tea and coffee in accordance with the specifications. Measurement and payments to be done in accordance with clause 141(b) of the standard Specs.	item	1		
A103/1.01	Executive desk 2.2x0.9m with six lockup drawers	No	2		
A103/1.02	Executive desk 2.2x0.9m with chair and three lockup drawers	No	4		
A103/1.03	Office tables	No	3		
A103/1.04	Swivel orthopaedic chairs	No	4		
A103/1.05	Standard chairs	No	6		
A103/1.06	Typist's desk	No	1		
A103/1.07	Typist's chair	No	1		
A103/1.08	Stationary cupboard, 1.2m3, lockable	No	5		
A103/1.09	Steel filing cabinet, 4 lockable drawers	No	5		
A103/1.10	Safe for cash and valuables min. size approx. 0.8mx0.5mx.4m to be concreted in place (wall/floor mounted) complete with lock and keys.	No	1		
A103/1.11	Bookshelf, 3 shelves 1.2m long with a sliding glass door	No	3		
A103/1.12	Conference table with 12 chairs	No	1		
A103/1.13	Ceiling fans	No	8		
A103/1.14	Air conditioner unit, 12000BTU/hr	No	6		
A103/1.15	Curtains for office	set	2		
A103/1.16	Computer meeting the following specifications Personal computer with 20" screen full multimedia, 320GB hard disk, 4.0GB RAM, Intel Core i5 processor, complete with all accessories preloaded with latest versions of windows OS, MS Office, Professional and MS Project	No	5		
A103/1.17	Laptop PC with Intel Core i5-350M Processor 17" screen, 4GB DDR3 RAM 300GB HDD 8xDVD+/-RW with latest versions of windows OS, MS Office, Professional and MS Project	No	12		
A103/1.18	Latest (A4) Laser Printer with accessories	No	5		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A103/1.19	Latest (A3) Laser Printer with accessories	No	1		
A103/1.20	Autodesk Civil 3D 2010 and Licences for above computers	No	3		
A103/1.21	HP Deskjet 1220 cxi A3 or equivalent A3 colour printers including consumables sufficient for the duration of the contract.	No	1		
A103/1.22	HP Scanjet 7450C scanner or equivalent with upto 2400-dpi resolution 50sheet automatic feeder ,fast SCSI and USB connectivity to PC	No	1		
A103/1.22	UPS 1 KVA with surge protector	No	5		
A103/1.23	Reams of A4 and A3 paper and consumables for the printers in quantity sufficient to complete the contract	LS	1		
A103/1.24	A3 photocopier (approved make) with feeder sorting trays, accessories and supplies sufficient to complete the project	No	1		
A103/1.25	Casio fx-992s or Equivalent Electronic scientific calculator, 12 figures	No	8		
A103/1.26	Stapling machine Offer size 50 or similar with 5000 staples	No	8		
A103/1.27	Heavy duty punch and spiral binder with consumables sufficient to complete the contract	No	1		
A103/1.28	Ordinary 2 hole paper punch	No	8		
A103/1.29	First Aid Kit	No	2		
A103/1.30	Fire Extinguisher	No	3		
A103/1.31	Snake Bite Kit	No	2		
A103/1.32	Filing Tray	No	10		
A103/1.33	Water filters	No	6		
A103/1.34	Waste paper basket	No	15		
A103/1.35	Refrigerator minimum capacity 0.2m2	No	1		
A103/1.36	Table – 0.8m2 surface area	No	1		
A103/1.37	3 plate electric cooker with oven and grill	No	1		
A103/1.38	Thermos jug 4.5L capacity	No	8		
A103/1.39	Digital Camera, 16.1 Megapixel(min), 1920x1080 full HD movie recording, optical steady Shot, sweep panorama, 2.7" LCD screen, minimum 5x digital zoom, multimedia card/SD 8GB memory, 12 scene selection modes, all inclusive.	No	2		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A103/1.40	PABX Telephone system including intercom connecting all offices and laboratory. Rate includes headsets, wiring and operational costs. Including High Speed Internet Access using optic fibre or HDSL (High Data Digital Subscriber Line) broadband connection networked to all computers, with annual subscription paid during the entire contract period.	item	1		
	SURVEY EQUIPMENT				
A106/1.01	Total station of approved type with ancillary equipment such as batteries, rapid charger, etc	No	1		
A106/1.02	Tripods wild GST/20 or equivalent	No.	6		
A106/1.03	Levels wild NAK2 or equivalent	No.	2		
A106/1.04	Metal (Aluminium) levelling stave (5m)-foldable	No.	4		
A106/1.05	Steel tape 50m	No.	4		
A106/1.06	Steel tape 25m	No.	6		
A106/1.07	Fibre glass tapes 50m	No.	5		
A106/1.08	Trumeter 0r equivalent wheeled measuring metre	No.	1		
A106/1.09	Ranging rods 2.5m	No.	10		
A106/1.10	Ranging rods 2.5m (metal, joinable)	No.	10		
A106/1.11	Optical squares	No.	4		
A106/1.12	Spare batteries	No.	4		
A106/1.13	Rapid charger	No.	1		
A106/1.14	Reflectors with mounts	No	6		
A106/1.15	Triple prism mount with reflectors	No.	2		
A106/1.16	Tribrachs	No.	4		
A106/1.17	Steel hammer (4kg)	No.	4		
A106/1.18	Spirit level for staves	No.	4		
A106/1.19	Metal pocket rulers (5m)	No.	12		
A106/1.20	Surveying umbrella	No.	2		
A106/1.21	Reflective road safety vests	No.	15		
A106/1.22	Drawing boards (field book frames A4)	No.	10		
	TOTAL CARRIED TO BILL ITEM 1.03				

APPENDIX TO BILL ITEM 1.05

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/1.00	Construct a material testing laboratory for the entire contract period. The rate includes the building, water, security, electricity, gas, cleaning in accordance with specification. Measurement and payment to be done in accordance with clause 141 (b) of the standard specifications.	item	1		
	1. FURNITURE				
A105/1.01	Meeting table (3.0mx 1.2m) with 6 chairs	No.	1		
A105/1.02	Ceiling fans	No.	4		
A105/1.03	Air conditioner unit, 12000 BTU/hr	No.	2		
A105/1.04	Desk 2.2m x 0.9m with 2 chest of drawers	No.	2		
A105/1.05	Office chairs, standard	No.	6		
A105/1.06	Chairs with arms	No.	8		
A105/1.07	Table (1.5mx .75m) with 2 drawers and 2 chairs.	No.	1		
A105/1.08	4-drawer Steel lockable filing cabinet	No.	2		
A105/1.09	Electronic scientific calculator, 12 figures	No.	4		
A105/1.10	Fire extinguisher, 10 litre capacity, CO2 type	No.	2		
A105/1.11	Steel filing cabinet, 4 drawers, lockable	No.	2		
A105/1.12	Steel filing cabinet, 2 drawers, lockable	No.	2		
A105/1.13	Bookshelf, 3 shelves 1.2m long (to hold box files)	No.	1		
A105/1.14	First aid kit	No.	1		
A105/1.15	Snake bite kit	No.	1		
A105/1.16	Water filters	No.	2		
	2. EQUIPMENT				
	(The following equipment shall be purpose made for use in the Engineer's laboratories and shall comply with the relevant British (BS) or American (AASHTO) Standards)				
	i). General Equipment				
A105/2.01	Compaction mould complete with base plate and extension collar, 101.6mm dia.x116.43mm high	No.	4		
A105/2.02	2.5kg Compaction rammer, drop regulated to 304.8mm	No.	4		
A105/2.03	4.535kg compaction rammer, drop regulated to 457.2mm	No.	4		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/2.04	Straight edge 300mm long, with handles	No.	6		
A105/2.05	Electric vibrating Kango Hammer fitted with steel tamper (BS1377) with support frame	No	1		
A105/2.06	Steel Tamper (BS 1377) compatible with Kango hammer	No.	4		
A105/2.07	Compaction mould complete with base plate and extension collar, 152.4mm dia.x116.43mm high	No.	4		
A105/2.08	Galvanized sample tray 1mx 0.5mx 75mm deep	No.	6		
A105/2.09	75mm brush	No.	10		
A105/2.10	Semi-automatic Electronic balance , 25kg capacity accurate to 10g, including weights	No.	1		
A105/2.11	20mm BS sieve, 300mm diameter	No.	2		
A105/2.12	Stop Clock	No.	2		
A105/2.13	Thermostatically controlled electric oven 104- 110oC, capacity 0.225m3	No.	2		
A105/2.14	As above but gas heated	No	1		
A105/2.15	Moisture tin, 90mm diameter 20mm deep, cadmium plated or aluminium alloy	No.	100		
A105/2.16	Cone penetrometer with gauge and automatically controlled test cup	No.	1		
A105/2.17	Test gauge	No.	1		
A105/2.18	Penetration test cup	No.	2		
A105/2.19	Penetration test cone	No.	3		
A105/2.20	Glass comparator	No.	2		
A105/2.21	Glass plate	No.	2		
A105/2.22	Evaporating Dish 150mm dia x 45mm depth	No.	4		
	ii). Density (Sand Replacement method BS 1377)				
A105/3.01	Metal container (450mm dia.)	No.	4		
A105/3.02	Stainless steel tray, 305mm diameter 50mm deep	No.	4		
A105/3.03	Metal tray with 150mm diameter hole in the centre, 300mm x 300mm square or equivalent area, 400mm deep	No.	3		
A105/3.04	Metal tray with 200mm diameter hole in the centre, 500mm x 500mm square, 50mm deep	No.	3		
A105/3.05	Steel pegs for fixing tray in position	No.	20		
A105/3.06	Sand pouring cylinder, 150mm diameter	No.	5		
A105/3.07	Sand pouring cylinder, 215mm diameter	No.	5		
A105/3.08	Cold steel chisel 20mm x 300mm long	No.	6		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/3.09	Cold steel chisel 10mm x 250mm long	No.	6		
A105/3.10	2 No. 1.5kg, 2no. 3.5kg mason hammers and 2No. 1kg rubber mallet	Set	3		
A105/3.11	Scoop for removing excavated material from hole, 250mm long handle	No.	10		
A105/3.12	100mm brush, soft	No.	4		
A105/3.13	50mm brush, soft	No.	6		
A105/3.14	Primus gas stove	No.	3		
A105/3.15	Calibration can 150mm diameter x 150mm deep	No.	4		
A105/3.16	Ditto but 200mm diameter x 250mm deep	No.	4		
	iii). Density test (Nuclear Density method AASHTO T238)				
A105/4.01	Nuclear density gauge (Troxler 3411B or similar approved)	No.	1		
A105/4.02	Hole forming Device(drill rod)	No.	3		
A105/4.03	Guide for above	No.	3		
	iv). CBR (AASHTO T193)				
A105/5.01	50 kN CBR Load frame complete with stabilising bar	No.	1		
A105/5.02	CBR penetration piston including bracket	No.	2		
A105/5.03	Penetration gauge range 0-25mm travel x 0.01 mm divisions	No.	2		
A105/5.04	Proving ring for above of 50 kN capacity	No.	2		
A105/5.05	Proving ring for above of 28 kN capacity	No.	1		
A105/5.06	Proving ring for above of 10 kN capacity	No.	1		
A105/5.07	CBR mould, 152.4mm dia. X 178mm high, complete with perforated base plate and extension collar 50.8mm high that can be fitted to either end of the mould	No.	50		
A105/5.08	Perforated swell plate 150mm dia. With an adjustable centre post of rustproof metal provided with a lock nut	No.	50		
A105/5.09	Swell tripod	No.	50		
A105/5.10	Swell dial gauge	No.	50		
A105/5.11	2.27kg slotted surcharge weight	No.	15		
A105/5.12	2.27kg annular surcharge weight	No.	30		
A105/5.13	2.8 kg solid base plate for CBR mould	No.	4		
A105/5.14	Central extruder, complete with 29KN hydraulic jack and accessories.	No.	1		
A105/5.15	Spacer disc with "T" handle	No.	4		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/5.16	Soaking tank for CBR mould sufficient to hold at least 100 moulds	No.	2		
	v). Specific Gravity for Aggregates (BS 812)				
A105/6.01	200mm dia. Wire mesh basket with apertures not greater than 6.5mm large enough to contain 2.5kg of aggregates	No.	1		
A105/6.02	A stout watertight container in which the basket can be freely suspended	No.	1		
A105/6.03	Soft absorbent cloth (tea towel)	No.	20		
A105/6.04	Shallow tray of area not less than 0.065m ²	No.	4		
A105/6.05	An airtight container of similar capacity to the basket	No.	2		
A105/6.06	Pycnometer of 1 litre capacity	No.	4		
A105/6.07	Electronic automatic 5kg balance accurate to 0.1g to be of size and type to permit the basket containing the sample to be suspended in water (to be supplied with weights)	No.	1		
A105/6.08	Well ventilated oven, thermostatically controlled to maintain a temperature of 105°C+5°C	No.	1		
	vi). Sieve Analysis				
A105/7.01	Sieve 300mm diameter : 75, 63, 50, 37.5, 28, 25, 19, 20, 14, 12.5, 10, 9.5, 6.3, 5, 4.75 and 4mm, plus lid and receiver	Set	3		
A105/7.02	Sieve 200mm diameter: 2.36, 2, 1.18, 1, 0.6, 0.5, 0.425, 0.300, 0.150 and 0.075mm plus lid and receiver	Set	3		
A105/7.03	Electric Sieve shaker	No.	1		
A105/7.04	1.2m x 1.2m x 50mm deep galvanized metal tray	No.	15		
A105/7.05	Riffle box with 50mm slots	No.	2		
	vii). Concrete: Slump and Cube Manufacture (BS 1881)				
A105/8.01	Slump cone, tamping rod and base	Set	3		
A105/8.02	Steel rule	No.	2		
A105/8.03	Concrete cube mould 150mm cube	No.	20		
A105/8.04	Large curing tank (capacity 50 No. Cubes)	No.	1		
A105/8.05	Cube tamping rod and spanner for item	No.	3		
	viii). Concrete: Cube Compression Testing				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/9.01	Concrete compression machine, to BS 1610 Grade A with 300mm gauge, rectangular platens, capacity 1560 kN with load pacer together with 100kN flexural frame with accessories	No.	1		
A105/9.02	Set of safety guards	No.	1		
A105/9.03	20mm distance piece	No.	1		
A105/9.04	50mm distance piece	No.	1		
A105/9.05	80mm distance piece	No.	1		
A105/9.06	100mm distance piece	No.	1		
A105/9.07	Assembly for beam tests	No.	1		
A105/9.08	Electro-mechanical load pacer, 100mm or equivalent distance piece	No.	1		
	ix). Aggregate and Chippings				
A105/9.09	Sand equivalent equipment to AASHTO T176 including a graduated plastic measuring cylinder, rubber stopper, irrigator tube weighed foot assembly, siphon assembly, 85ml tinned box(57mm dia), wide mouth funnel(100mm dia.), stop clock, mechanical shaker and 10 litre jar	Set	1		
A105/9.10	Los Angeles Abrasion machine	Set	1		
A105/9.11	Standard aggregate crushing value apparatus, supplied complete with cylinder, plunger, base plate, tamping rod and measure.	Set	3		
A105/9.12	Aggregate Impact testing machine to determine the aggregate impact value (AIV)	No.	1		
A105/9.13	Sodium sulphate test apparatus	No.	10		
A105/9.14	Beaker 250ml	No.	2		
A105/9.15	Reagent grade silica gel, 500g container	No.	100		
A105/9.16	Tamping rod 8mm dia. X 300mm long and metal measure 115mm dia. X 180mm deep for above (BS 812)	No.	1		
A105/9.17	Flakiness gauge (BS 812) passing 10.0mm retain 6.3mm	No.	1		
A105/9.18	Flakiness gauge (BS 812) passing 14.0mm retain 10.0mm	No.	1		
A105/9.19	Flakiness gauge (BS 812) passing 20.0mm retain 14.0mm	No.	1		
A105/9.20	Flakiness gauge (BS 812) passing 28.0mm retain 20.0mm	No.	1		
A105/9.21	Flakiness gauge (BS 812) passing 37.5mm retain 28.0mm	No.	1		
A105/9.22	Flakiness gauge (BS 812) passing 50.0mm retain 37.5mm	No.	1		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/9.23	Flakiness gauge (BS 812) passing 63.0mm retain 50.0mm	No.	1		
	x). Tray Spray and Spread Rate Tests				
A105/10.01	Transverse distribution test of bitumen spray (depot tray test to BS 1707) equipment	No.	1		
A105/10.02	Rate of spread of coated chippings Tray and chains	No.	4		
A105/10.03	Calibrated spring balance	No.	4		
A105/10.04	Steel tray 306x306x38mm(for measuring bitumen spray rate)	No.	10		
A105/10.05	Gunny sacks	No.	400		
A105/10.06	Plastic bag 900 x 450mm x 1000 gauge	No.	2000		
A105/10.07	Plastic bag 450 x 300mm x 1000 gauge	No.	2000		
A105/10.08	Filter paper 150mm dia. Whatman No. 5 (Boxes of 100)	No.	40		
A105/10.09	Filter paper 400mm dia. Whatman No. 5 (Boxes of 100)	No.	20		
A105/10.10	Filter paper 100mm dia. Whatman No. 5 (Boxes of 100)	No.	20		
A105/10.11	Cotton Waste (or drying cloth)	KG	20		
A105/10.12	Filter paper 400mm dia. Whatman No. 54 (Boxes of 100)	No.	10		
	xi). Miscellaneous				
A105/11.01	Gas cylinders 13kg	No.	5		
A105/11.02	Padlocks	No.	6		
A105/11.03	Plastic jerry cans 20 litre capacity	No.	6		
A105/11.04	Paper punch	No.	2		
A105/11.05	Stapler with pins	No.	2		
A105/11.06	Tray lifting callipers	No.	4		
A105/11.07	Laboratory dust coats-Brown	No.	16		
A105/11.08	Laboratory dust coats-White	No.	6		
A105/11.09	Asbestos gloves	No.	16		
A105/11.10	Laboratory gumboots(assorted sizes)	No.	16		
A105/11.11	Wheel barrow	No.	4		
A105/11.12	Dust pan plus brush	No.	4		
A105/11.13	Hand shovel	No.	6		
A105/11.14	Pick axe with handle	No.	6		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/11.15	Metal scoop, large (120x190x70mm) cast aluminium handle	No.	4		
A105/11.16	Metal scoop, large (70x110x40mm) cast aluminium handle	No.	6		
A105/11.17	Garden trowel	No.	4		
A105/11.18	Sample tray 306x306x38mm	No.	20		
A105/11.19	Spatula 200mm blade	No.	6		
A105/11.20	Spatula 100mm blade	No.	6		
A105/11.21	BS sieve 450mm dia, 37.5mm	No.	1		
A105/11.22	BS sieve 450mm dia, 20mm	No.	1		
A105/11.23	BS sieve 450mm dia, 5mm	No.	1		
A105/11.24	BS sieve 450mm dia, 0.425mm	No.	2		
A105/11.25	BS sieve 450mm dia, 0.3mm	No.	2		
A105/11.26	BS sieve 450mm dia, 0.75mm	No.	2		
A105/11.27	Set of lid and receiver for item 212 to item 217	No.	1		
A105/11.28	BS sieve brush double ended brass and nylon bristle	No.	4		
A105/11.29	Measuring cylinders plastic with sprout 100ml, 250ml, 500ml capacity.	set	3		
A105/11.30	Glass jar capacity 5 litres with lid	No.	10		
A105/11.31	200mmx200mmx20mm cadmium plated or aluminium tin	No.	50		
A105/11.32	Electronic Automatic balance, capacity 1000g accurate to 0.01g	No.	1		
A105/11.33	Electronic Automatic balance, capacity 2100g accurate to 0.01g	No.	1		
A105/11.34	Electronic Automatic balance, capacity 20kg accurate to 0.01g	No.	1		
A105/11.35	Dial -0-gram balance 310g capacity accuracy to 0.1g	No.	1		
A105/11.36	Field and laboratory scale with scoop 10000g capacity accurate to 1.0g	No.	1		
A105/11.37	Distilled water still	No.	1		
A105/11.38	Polythene or glass 20 litre storage vessels with tap at bottom	No.	2		
A105/11.39	Set of stiff broom and soft broom with handles	No.	5		
A105/11.40	Vernier callipers, 150mm, accurate to 0.1mm	No.	1		
A105/11.41	As above but 200mm, accurate to 0.002mm	No.	1		
A105/11.42	Pestle and mortar	No.	2		
A105/11.43	Linear shrinkage mould (BS 1377)	No.	25		
A105/11.44	Average least dimension gauge	No.	2		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/11.45	Lockable tool box containing: 1pair "Molegrip" 2x150mm screw driver, 2x200mm screw driver, 2x300mm screw driver, (1 std and 1 'Phillips' star head of each), adjustable spanners 200mm and 300mm, 1 pr Round-nosed pliers, 1 pair general purpose pliers	No.	1		
A105/11.46	Plastic or metal bucket including lid, 10 litres capacity	No.	10		
A105/11.47	Polythene wash bottle	No.	6		
A105/11.48	A4 size clipboard	No.	10		
A105/11.49	Mercury thermometer, range-1de.cent. To 15deg.cent glass (BS 593)	No.	4		
A105/11.50	Minimum and maximum thermometer(BS 692)	No.	2		
A105/11.51	Rain gauge	No.	4		
A105/11.52	Portable dial thermometer +50oC to +2500C accurate to $\pm 3\%$ with 0.65 long stem	No.	3		
A105/11.53	As above but with 1ml long stem	No.	2		
A105/11.54	5 litre capacity steel storage container with leak and dustproof lids for storage of bitumen samples	No.	100		
A105/11.55	Hotplate 200mm dia. With simmerstat heat control unit	No.	2		
A105/11.56	450mm diameter x 150mm deep metallic karais	No.	20		
A105/11.57	MOT straight edge with accessories	No.	1		
A105/11.58	Metric wedge	No.	1		
A105/11.59	Transit case	No.	1		
	xii). Standard Specification (Copies of each of the latest editions of the following Standards)				
A105/12.01	KS 1725	No.	1		
A105/12.02	BS 812, Testing aggregates	No.	1		
A105/12.03	BS 882:1992, Specification for aggregates from natural sources for concrete (AMD 13579) (No longer current but cited in Building Regulations)	No.	1		
A105/12.04	BS 1377: 1990, Methods of testing soils for Civil engineering purposes	No.	1		
A105/12.05	BS 1881: Methods of testing concrete	No.	1		
A105/12.06	BS 434-2:2006, Bitumen road emulsions. Code of practice for use of cationic bitumen emulsions on roads and other paved areas	No.	1		
A105/12.07	BS EN 1008:2002, Mixing water for concrete	No.	1		
A105/12.08	BS 4449:2005, Steel for the reinforcement of concrete - Weldable reinforcing steel - Bar, coil and decoiled product - Specification (+A2:2009)	No.	1		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
A105/12.09	BS 8666:2005, Scheduling, dimensioning, bending and cutting of steel reinforcement for concrete - Specification (incorporating Amendment No.1)	No.	1		
A105/12.10	BS 5911-200:1994: Precast concrete pipes and ancillary concrete products. Unreinforced and reinforced manholes and soakaways of circular cross section (AMD 11031) (AMD 13205) (No longer current but cited in Building Regulations)	No.	1		
A105/12.11	BS 8004: Code of practice for foundations	No.	1		
A105/12.12	Overseas Road Note 3, (ORN 3), A guide to surface dressing in tropical and sub-tropical countries	No.	1		
A105/12.13	Standard Specifications for Transportation Material and Methods of Sampling and Testing (AASHTO) Parts I and II, 14th Edition	No.	1		
A105/12.14	Asphalt Institute Standards: MS-2, Mix design methods for asphalt concrete and other hot-mix types	No.	1		
	xiii). Marshall Test (ASTM D1559)				
A105/13.01	Petrol driven 100mm dia core cutter with all accessories	No.	1		
A105/13.02	Specimen mould + base plate + extension collar	No.	10		
A105/13.03	Specimen extractor	No.	2		
A105/13.04	Compaction hammer	No.	2		
A105/13.05	Compaction pedestal + specimen mould holder	No.	2		
A105/13.06	Breaking head mould	No.	1		
A105/13.07	Electrical 30 kN Marshall compression testing machine	No.	1		
A105/13.08	Suitable electrically operated laboratory mixer, 10 litre capacity	No.	1		
A105/13.09	Proving ring 28kN capacity graduated in 0.0025mm	No.	1		
A105/13.10	Flow-meter	No.	2		
A105/13.11	Suitable mechanical mixer	No.	1		
A105/13.12	Water bath at least 150mm deep thermostatically controlled to maintain water at 60oC ± 1oC with a perforated false bottom or equipped with a shelf to support specimen 50mm above the bottom of the bath, with cover	No.	1		
A105/13.13	Thermometer (50oC to 25oC) 50mm dia with 180mm stainless steel stem	No.	2		
A105/13.14	Bench mounted mixer, 5 litre capacity with isomantle electric heater	No.	2		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	xiv). Bitumen Extraction Test				
	(a) Cold extraction Bottle Roller Method, BS 598:102				
A105/14.01	Electronic top pan balance 4kg capacity	No.	1		
A105/14.02	Flat bottomed scoop	No.	3		
A105/14.03	Steel garden trowel	No.	2		
A105/14.04	Large steel spoon	No.	2		
A105/14.05	Heat resistant gloves	pair	10		
A105/14.06	Foot pump for pressurizing air –water assemblies upto a maximum of 700kN/m ² and fitted with flexible hose approximately 1.2m long and connector	No.	2		
A105/14.07	Steel bottle 600ml capacity with 50mm dia rubber stopper	No.	2		
A105/14.08	Steel bottle 2500ml capacity with 70mm dia rubber stopper	No.	2		
A105/14.09	Steel bottle 7000ml capacity with 70mm dia rubber stopper	No.	2		
A105/14.10	Flask funnel for fitting to the 700ml steel bottle with the rim of the funnel retaining sieve 200mm nominal diameter	No.	1		
A105/14.11	Bottle roller compact bench mounted unit designed to rotate two bottles simultaneously about the longitudinal axis	No.	1		
A105/14.12	Pressure filter complete with cutting tool for making a hole in the filter paper	No.	1		
A105/14.13	Filter funnel to take 200mm nominal diameter sieves	No.	2		
A105/14.14	Continuous flow centrifuge	No.	1		
A105/14.15	Binder recovery apparatus	No.	1		
A105/14.16	Volumetric flask 250ml, 500ml, 100ml and 2000ml capacity each	No.	2		
A105/14.17	Recovery still for Dichloromethane	No.	1		
A105/15.01	Hot extractor complete with steel pot with gasket and gauze container, dean and stark receiver, Liebig condenser and a box of filter paper – Whatman No. 5x400mm dia or equivalent	No.	2		
	(b) Hot Extraction Method, BS 598				
	COMPACTORS				
	BS EN 12697-31				
A105/16.01	Gyratory compactor ELE SERVO PAC or equivalent with 1 No 100mm and 1 No 150mm dia mould including all accessories and parts complete for use in testing	No.	1		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	BS EN 12697-32				
A105/17.01	Percentage Refusal Density (PRD) Vibrating hammer compactor complete with shanks, tampers (small and large), 6 split moulds, 7 base plates from ELE or equivalent	No.	1		
	xv). Consumables				
A105/18.01	Paraffin wax	kg	50		
A105/18.02	Gas	kg	500		
A105/18.03	Gunny sack	No.	250		
A105/18.04	Plastic bag 900 x 450mm x 1000 gauge	No.	1000		
A105/18.05	Plastic bag 450 x 300mm x 1000 gauge	No.	1000		
A105/18.06	Filter paper 150mm dia., Whatman No. 5 (Boxes of 100)	No.	40		
A105/18.07	Filter paper 400mm dia., Whatman No. 5 (Boxes of 100)	No.	20		
A105/18.08	Filter paper 100mm dia., Whatman No. 5 (Boxes of 100)	No.	20		
A105/18.09	Filter paper 400mm dia., Whatman No. 54 (Boxes of 100)	No.	5		
A105/18.10	Filter paper 270mm dia., 33mm with dia. Hole in centre, Whatman No 5 (Box of 100)	No.	15		
A105/18.11	Trichloroethylene	kg	2000		
A105/18.12	Dichloromethane	kg	1000		
A105/18.13	Cotton waste	kg	200		
A105/18.14	Gas cylinders compatible with supplied stoves	No.	15		
	TOTAL CARRIED TO BILL ITEM 1.05				

Technical Proposal

- a. Site Organization**
- b. Method Statement**
- c. Mobilization Schedule**
- d. Construction Schedule**
- e. ESHS Management Strategies and Implementation Plans**
- f. Code of Conduct (ESHS)**
- g. Equipment**
- h. Key Personnel Schedule**
- i. Quality Assurance System**
- j. Breakdown of unit rates**
- k. Breakdown of local content percentage**
- l. Others**

Site Organization

Bidders shall provide the following:

1. An organization chart for Head Office staff who will be directly concerned with the Contract.
2. An organization chart for Site management and key technical supervisory staff.
3. A schedule of all proposed Site management and key technical supervisory staff, corresponding to item 2. above, in the following format:

Name and Nationality	Qualifications (See note 1)	Proposed Position & Responsibility	Years of Experience at this Position/ Level	Years of Directly Relevant Experience (See note 2)

Note 1: The ability including evidence to speak the Contract language English should be stated, as well as academic and technical qualifications.

Note 2: This must clearly state periods, giving month, year and country, during which the nominee has been involved in works which directly fit them for the position proposed. (e.g. for an Asphalt Pavement Engineer relevant work should directly involve construction of asphaltic mixtures.)

Method Statement

The Bidder shall submit a narrative outlining his intended methods for undertaking the Works. This narrative should include, but not be limited to, details of the following:

- i) the methods to be used in procuring the necessary resources, their transportation to the Site and their installation;
- ii) methods to be employed in constructing the Works, including specific details of the Contractor's and Engineer's establishments, earthworks and drainage the production and construction of: gravel sub-base, crushed aggregate base, asphalt surfacing and concrete, the repair of existing concrete structures and clearance of the Site after completion of construction;
- iii) for each major element of work and production of materials (e.g. stone quarry and aggregates), prepare a separate table showing number of labour by craft and all items of plant to form one "gang (labour and plant)" and the assumed production rates for one gang including how haulage will be managed.
- iv) the methods to be employed in meeting the Contractor's obligations for providing for the safety and passage of public traffic during construction operations;
- v) proposals for sources of construction materials, including bitumen, and detailed proposals for the sourcing, winning and processing of naturally occurring materials (e.g. borrows and quarries including modification of that material to meet the specification) plus gaining approval for the materials
- vi) traffic management, environmental management plan
- vii) environmental, social, health and safety (ESHS)

(See Special Specification for additional requirements to be undertaken during Contract)

Mobilization Schedule

Construction Schedule

The Contractor is required to complete the Works within the date stated in the contract agreement. The Bidder shall provide a construction schedule, showing the sequence of all major work items, and identifying any critical path operations. The schedule shall show the resources associated with each construction operation and, in particular, shall show a histogram of the requirement for all labour and major items of Contractor's Equipment taking in to account the effect of rainy season. The following shall specifically be shown:

1. Date of Commencement
2. Time for Completion
3. Completion of the Contractor's and the Engineer's camps and other establishment items, including transport for the Engineer
4. Provision of temporary facilities for the Engineer until the long-term ones are complete
5. Requirements for Possession of Site
6. Sourcing and approvals of materials
7. On site production of materials e.g. at each borrow area, stone quarry and asphalt plant
8. For major work items the quantities, production rates for one "gang" as described in your method statement, the number of "gangs" and duration
9. If the tenderer plans to subcontract part of the works, he must provide the following details

No.	Work intended to be subcontracted	Name and details of subcontractors	Value of subcontract as percentage of the total cost of the project	Experience in similar work (details to be specified)
1				
2				
3				
4				
5				
6				
7				
8				

(See Specials Specification for additional requirements with regard to Planning, Development of Construction Schedule and Reporting during Contract)

ESHS Management Strategies and Implementation Plans

(ESHS-MSIP)

The Bidder shall submit comprehensive and concise Environmental, Social, Health and Safety Management Strategies and Implementation Plans (ESHS-MSIP) as required by ITB 11.1 (h) of the Bid Data Sheet. These strategies and plans shall describe in detail the actions, materials, equipment, management processes etc. that will be implemented by the Contractor, and its subcontractors.

In developing these strategies and plans, the Bidder shall have regard to the ESHS provisions of the contract including those as may be more fully described in the Works Requirements described in Section VII.

Code of Conduct: Environmental, Social, Health and Safety (ESHS)

The Bidder shall submit the Code of Conduct that will apply to the Contractor's employees and subcontractors as required by ITB 11.1 (h) of the Bid Data Sheet. The Code of Conduct shall ensure compliance with the ESHS provisions of the contract, including those as may be more fully described in the *Works Requirements described in Section VII*.

In addition, the Bidder shall submit an outline of how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches.

Form EQU: Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Bidder.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

Personnel

Form PER -1

Contractor's Representative and Key Personnel Schedule

Bidders should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor' Representative and Key Personnel

1.	Title of position: Contractor's Representative	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
2.	Title of position: <i>[Environmental Specialist]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
3.	Title of position: <i>[Health and Safety Specialist]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
4.	Title of position: <i>[Social Specialist]</i>	

	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
5.	Title of position: <i>[insert title]</i>	
	Name of candidate	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>

*As listed in Section III.

**Form PER-2:
Resume and Declaration
Contractor's Representative and Key Personnel**

Name of Bidder

Position [#1]: <i>[title of position from Form PER-1]</i>
--

Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>	
details		
	Address of employer:	
	Telephone:	Contact (manager / personnel officer):
	Fax:	
	Job title:	Years with present employer:

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	Role	Duration of involvement	Relevant experience
<i>[main project details]</i>	<i>[role and responsibilities on the project]</i>	<i>[time in role]</i>	<i>[describe the experience relevant to this position]</i>

Declaration

I, the undersigned *[insert either “Contractor’s Representative” or “Key Personnel” as applicable]*, certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Bid:

Commitment	Details
Commitment to duration of contract:	<i>[insert period (start and end dates) for which this Contractor’s Representative or Key Personnel is available to work on this contract]</i>
Time commitment:	<i>[insert period (start and end dates) for which this Contractor’s Representative or Key Personnel is available to work on this contract]</i>

I understand that any misrepresentation or omission in this Form may:

- (a) be taken into consideration during Bid evaluation;
- (b) result in my disqualification from participating in the Bid;
- (c) result in my dismissal from the contract.

Name of Contractor’s Representative or Key Personnel: *[insert name]*

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Bidder:

Signature: _____

Date: (day month year): _____

Quality Assurance Systems

Please provide hereunder details of the proposed quality assurance system you intend to use to ensure successful, safe and planned access to site; production; field operations; inspection, sampling and site testing; site trials and completion of the works.

Also provide details of how you intend to undertake an internal audit at regular intervals and what measures you will put in place for corrective action should the internal audit show discrepancies.

In addition, include a plan that clearly shows how you will seek approval in a timely manner for all materials, undertake laboratory testing and site trials and maintain a record and status of approvals for all materials

(See Specials Specification for additional requirements to be undertaken during Contract)

Breakdown of unit Rates

Please provide hereunder detailed breakdown of unit rates in a tabular form. This shall entail giving the breakdown of each unit price from first principle. Items may include Materials, labour, equipment, General overheads, site overheads, profits and contingencies etc cetera. Bill 1, Bill 22 and Bill 25 bill items are excluded from the requirement.

Breakdown of Local content percentage

Please provide hereunder particulars of local content costs for the bid.

Ref	Cost Description	Local (Kshs)	Foreign (Kshs)	Total (Kshs)
1	Anticipated expenditure on suppliers of materials and services			
2	Anticipated expenditures on subcontractors			
3	Anticipated expenditures on labour			
4	Anticipated expenditures on equipment			
5	Anticipated expenditures on general overheads			
6	Anticipated expenditures on site overheads			
7	Anticipated other expenditures			
	TOTAL			
	PERCENTAGE OF TOTAL			

Others

This is optional. The bidder (s) may choose to provide any additional information it deems fit to support the bid.

Bidders Qualification without prequalification

To establish its qualifications to perform the contract in accordance with Section III (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder.

Form ELI -1.1

Bidder Information Form

Date: _____
 ICB No. and title: _____
 Page _____ of _____ pages

Bidder's name
In case of Joint Venture (JV), name of each member:
Bidder's actual or intended country of registration: <i>[indicate country of Constitution]</i>
Bidder's actual or intended year of incorporation:
Bidder's legal address [in country of registration]:
Bidder's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITB 4.3. <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. <input type="checkbox"/> In case of Government-owned enterprise or institution, in accordance with ITB 4.5 documents establishing: <ul style="list-style-type: none"> • Legal and financial autonomy • Operation under commercial law • Establishing that the Bidder is not dependent agency of the Employer
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form ELI -1.2**Bidder's JV Information Form**
(to be completed for each member of Bidder's JV)

Date: _____
ICB No. and title: _____
Page _____ of _____ pages

Bidder's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.3. <input type="checkbox"/> In case of a Government-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and absence of dependent status, in accordance with ITB 4.5.
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form CON – 2**Historical Contract Non-Performance, Pending Litigation
and Litigation History***[To be filled by the Bidder and for each member of a Joint Venture]*

Bidder's Name: _____

Date: _____

JV Member's Name _____

ICB No. and title: _____

Page _____ of _____ pages

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January <i>[insert year]</i> specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.			
<input type="checkbox"/> Contract(s) not performed since 1 st January <i>[insert year]</i> specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
Year	Non-performed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for non performance: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>
Pending Litigation, in accordance with Section III, Qualification Criteria and Requirements			
<input type="checkbox"/> No pending litigation in accordance with Section III, Qualification Criteria and Requirements, Sub-Factor 2.3.			
<input type="checkbox"/> Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), USD Equivalent (exchange rate)
		Contract Identification: _____ Name of Employer: _____ Address of Employer: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	
<input type="checkbox"/> No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3. <input type="checkbox"/> Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			
Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (currency), USD Equivalent (exchange rate)
		Contract Identification: Name of Employer: Address of Employer: Matter in dispute: Party who initiated the dispute: Status of dispute:	

Form CON – 3

Environmental, Social, Health, and Safety**Performance Declaration**

[The following table shall be filled in for the Bidder, each member of a Joint Venture and each Specialized Subcontractor]

Bidder's Name: *[insert full name]*

Date: *[insert day, month, year]*

Joint Venture Member's or Specialized Subcontractor's Name: *[insert full name]*

ICB No. and title: *[insert ICB number and title]*

Page *[insert page number]* **of** *[insert total number]* **pages**

Environmental, Social, Health, and Safety Performance Declaration in accordance with Section III, Qualification Criteria, and Requirements			
<input type="checkbox"/> No suspension or termination of contract: An employer has not suspended or terminated a contract and/or called the performance security for a contract for reasons related to Environmental, Social, Health, or Safety (ESHS) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5.			
<input type="checkbox"/> Declaration of suspension or termination of contract: The following contract(s) has/have been suspended or terminated and/or Performance Security called by an employer(s) for reasons related to Environmental, Social, Health, or Safety (ESHS) performance since the date specified in Section III, Qualification Criteria, and Requirements, Sub-Factor 2.5. Details are described below:			
Year	Suspended or terminated portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i>	<i>[insert amount]</i>

		Address of Employer: <i>[insert street/city/country]</i> Reason(s) for suspension or termination: <i>[indicate main reason(s)]</i>	
...	...	<i>[list all applicable contracts]</i>	...
Performance Security called by an employer(s) for reasons related to ESHS performance			
Year	Contract Identification		Total Contract Amount (current value, currency, exchange rate and US\$ equivalent)
<i>[insert year]</i>	Contract Identification: <i>[indicate complete contract name/ number, and any other identification]</i> Name of Employer: <i>[insert full name]</i> Address of Employer: <i>[insert street/city/country]</i> Reason(s) for calling of performance security: <i>[indicate main reason(s)]</i>		<i>[insert amount]</i>

Form FIN – 3.1:**Financial Situation and Performance**

[To be filled by the Bidder and for each member of a Joint Venture]

Bidder's Name: _____

Date: _____

JV Member's Name _____

ICB No. and title: _____

Page _____ of _____ pages

1. Financial data

Type of Financial information in (currency)	Historic information for previous _____ years, _____ (amount in currency, currency, exchange rate*, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITB 15 for the exchange rate

2. Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (US\$ equivalent)
1		
2		
3		

2. Financial documents

The Bidder and its parties shall provide copies of financial statements for _____ years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor 3.1. The financial statements shall:

- (a) reflect the financial situation of the Bidder or in case of JV member, and not an affiliated entity (such as parent company or group member).
- (b) be independently audited or certified in accordance with local legislation.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

☐ Attached are copies of financial statements¹⁵ for the _____ years required above; and complying with the requirements

¹⁵ If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

Form FIN – 3.2:**Average Annual Construction Turnover***[To be filled by the Bidder and for each member of a Joint Venture]*

Bidder's Name: _____

Date: _____

JV Member's Name _____

ICB No. and title: _____

Page _____ of _____ pages

		Annual turnover data (construction only)	
Year	Amount Currency	Exchange rate	USD equivalent
<i>[indicate year]</i>	<i>[insert amount and indicate currency]</i>		
Average Annual Construction Turnover *			

* See Section III, Evaluation and Qualification Criteria, Sub-Factor 3.2.

Form FIN – 3.3:**Financial Resources**

[To be filled by the Bidder and for each member of a Joint Venture]

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III (Evaluation and Qualification Criteria)

Financial Resources		
No.	Source of financing	Amount (US\$ equivalent)
1		
2		
3		

Form FIN – 3.4:

Current Contract Commitments / Works in Progress

Bidders and each member to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Current Contract Commitments					
No.	Name of Contract	Employer's Contact Address, Tel, Fax	Value of Outstanding Work [Current US\$ Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [US\$/month]
1					
2					
3					
4					
5					

Form EXP - 4.1**General Construction Experience**

[To be filled by the Bidder and for each member of a Joint Venture]

Bidder's Name: _____

Date: _____

JV Member's Name _____

ICB No. and title: _____

Page _____ of _____ pages

Starting Year	Ending Year	Contract Identification	Role of Bidder
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Bidder: _____ Amount of contract: _____ Name of Employer: _____ Address: _____	

Form EXP - 4.2(a)

Specific Construction and Contract Management Experience

[To be filled by the Bidder and for each member of a Joint Venture]

Bidder's Name: _____

Date: _____

JV Member's Name _____

ICB No. and title: _____

Page _____ of _____ pages

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount			US\$	
If member in a JV or sub-contractor, specify participation in total Contract amount				
Employer's Name:				
Address:				
Telephone/fax number				
E-mail:				

Form EXP - 4.2(a) (cont.)
Specific Construction and Contract Management
Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

Form EXP - 4.2(b)

Construction Experience in Key Activities

Bidder's Name: _____

Date: _____

Bidder's JV Member Name: _____

Sub-contractor's Name¹⁶ (as per ITB 34.2 and 34.3): _____

ICB No. and title: _____

Page _____ of _____ pages

All Sub-contractors for key activities must complete the information in this form as per ITB 34.2 and 34.3 and Section III, Qualification Criteria and Requirements, Sub-Factor 4.2.

1. Key Activity No One: _____

Information				
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount			US\$	
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)		Actual Quantity Performed (i) x (ii)
Year 1				
Year 2				
Year 3				
Year 4				

¹⁶ If applicable

	Information
Employer's Name:	
Address:	
Telephone/fax number	
E-mail:	

2. Activity No. Two

3.

	Information
Description of the key activities in accordance with Sub-Factor 4.2(b) of Section III:	

Form of Bid Security

(Demand Guarantee)

[Guarantor Letterhead or SWIFT identifier code]

**Beneficiary: Director General, Kenya National Highways Authority (KeNHA),
P.O. Box 49712-00100 Nairobi**

Invitation for Bids No: _____

Date: _____

BID GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its bid (hereinafter called "the Bid") for the execution of _____ under Invitation for Bids No. _____ ("the IFB").

Furthermore, we understand that, according to the Beneficiary's conditions, bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of bid validity set forth in the Applicant's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the performance security and, if required, the Environmental, Social, Health and Safety (ESHS) Performance Security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's bidding document.

This guarantee will expire: (a) if the Applicant is the successful bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the performance security and, if required, the Environmental, Social, Health and Safety (ESHS) Performance Security, issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

[signature(s)]

Section V. Eligible Countries

Eligibility for the Provision of Goods, Works and Non Consulting Services in Bank-Financed Procurement

1. In reference to ITB 4.7 and 5.1, for the information of the Bidders, at the present time firms, goods and services from the following countries are excluded from this bidding process:

Under ITB4.7(a) and 5.1: *NONE*

Under ITB4.7(b) and 5.1: *NONE*

Section VI. Bank Policy - Corrupt and Fraudulent Practices

Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011.

“Fraud and Corruption:

1.16 It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts.¹⁷ In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (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;¹⁸
 - (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;¹⁹
 - (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;²⁰
 - (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;²¹
 - (v) “obstructive practice” is

¹⁷ In this context, any action to influence the procurement process or contract execution for undue advantage is improper.

¹⁸ For the purpose of this sub-paragraph, “another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

¹⁹ For the purpose of this sub-paragraph, “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

²⁰ For the purpose of this sub-paragraph, “parties” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

²¹ For the purpose of this sub-paragraph, “party” refers to a participant in the procurement process or contract execution.

- (aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
 - (bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 1.16(e) below.
- (b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
- (c) will declare misprocurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;
- (d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures,²² including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated²³;
- (e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to

²² A firm or individual may be declared ineligible to be awarded a Bank financed contract upon: (i) completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, and through the application the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption; and (ii) as a result of temporary suspension or early temporary suspension in connection with an ongoing sanctions proceeding. See footnote 14 and paragraph 8 of Appendix 1 of these Guidelines.

²³ A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which has either been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.

the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.”

PART 2 –WORKS REQUIREMENTS

Section VII. Works Requirements

Contents

Scope of Works	190
Specification	191
Environmental, social, health and safety requirements.....	283
Drawings.....	284
Supplementary Information	285

Scope of Works

The scope of works and the location and extent of the site is described in Section I of the Special Technical Specifications

Specifications

The Special Specifications are to be read in conjunction with the Kenya Standard Specification for Road and Bridge Construction, Ministry of Transport and Communications, 1986.

SPECIAL SPECIFICATION

<u>SECTION 1 – GENERAL</u>	197
100 <u>SPECIAL SPECIFICATION</u>	197
101 <u>LOCATION AND EXTENT OF SITE</u>	197
102 <u>EXTENT OF CONTRACT</u>	197
103 <u>CONTRACT DRAWINGS</u>	198
104 <u>PROGRAMME</u>	199
107 <u>CERTIFICATE OF COMPLETION</u>	200
108 <u>METHOD OF CONSTRUCTION</u>	200
109 <u>NOTICE OF OPERATIONS</u>	200
117 <u>HEALTH, SAFETY AND ACCIDENTS</u>	200
119 <u>USE OF EXPLOSIVES</u>	201
121 <u>DIVERSION OF SERVICES</u>	201
124 <u>PROVISION OF LAND</u>	202
125 <u>BOREHOLES</u>	202
126 <u>MATERIALS AND MANUFACTURED GOODS</u>	204
127 <u>INFORMATION FROM EXPLORATORY BORINGS AND TEST PITS</u>	204
130 <u>PROGRESS PHOTOGRAPHS</u>	205
131 <u>SIGNBOARDS</u>	206
132 <u>HOUSING ACCOMODATION FOR THE RESIDENT ENGINEER AND HIS STAFF AND LABORATORY INCLUDING FURNITURE AND SURVEY EQUIPMENT</u>	206
133 <u>TIME FOR ERECTION OF THE ENGINEER'S STAFF HOUSES, OFFICES AND LABORATORY</u>	217
135 <u>MAINTENANCE OF THE ENGINEER'S STAFF HOUSES, OFFICES, LABORATORIES, FURNITURE AND EQUIPMENT</u>	218
137 <u>ATTENDANCE UPON THE ENGINEER AND HIS STAFF</u>	218
138 <u>PROVISION OF VEHICLES AND METHOD OF PAYMENT</u>	218
139 <u>MISCELLANEOUS ACCOUNTS</u>	219
140 <u>PAYMENT OF OVERTIME FOR ENGINEER'S JUNIOR STAFF</u>	219
141 <u>MEASUREMENT AND PAYMENT</u>	220
143 <u>MONITORING OF RAINFALL AT THE SITE</u>	234
<u>SECTION 2 - MATERIALS AND TESTING OF MATERIALS</u>	235
202 <u>TESTING BY THE CONTRACTOR</u>	235
205 <u>SOILS AND GRAVEL</u>	235
228 <u>WORKMANSHIP AND QUALITY CONTROL</u>	235
<u>Section 3 - SETTING OUT & TOLERANCES</u>	237
301 <u>SETTING OUT</u>	237
302 <u>TOLERANCES</u>	238
<u>Section 4 - SITE CLEARANCE AND TOP SOIL STRIPPING</u>	239
401 <u>SITE CLEARANCE</u>	239

402	<u>REMOVAL OF TOPSOIL</u>	239
403	<u>REMOVAL OF STRUCTURES, FENCES AND OBSTRUCTIONS</u>	240
<u>SECTION 5 - EARTHWORKS</u>		241
503	<u>CLASSIFICATION OF MATERIAL</u>	241
504	<u>PREPARATION PRIOR TO FORMING EMBANKMENTS</u>	241
508	<u>COMPACTION OF EARTHWORKS</u>	244
509	<u>MASS-HAUL DIAGRAM</u>	245
511	<u>BORROW PITS</u>	245
517	<u>MEASUREMENT AND PAYMENT</u>	245
<u>Section 6 - QUARRIES, BORROW PITS, STOCKPILES AND SPOIL AREAS</u>		246
601	<u>GENERAL</u>	246
603	<u>PROVISION OF LAND</u>	246
605	<u>SAFETY AND PUBLIC HEALTH REQUIREMENT</u>	247
607	<u>SITE CLEARANCE AND REMOVAL OF TOPSOIL AND OVERBURDEN</u>	247
611	<u>OPENING AND WORKING OF BORROW PITS</u>	248
612	<u>REINSTATEMENT OF BORROW AREAS</u>	249
<u>SECTION 7 - EXCAVATION AND FILLING FOR STRUCTURES</u>		251
703	<u>EXCAVATION OF FOUNDATIONS FOR STRUCTURES</u>	251
707	<u>BACKFILLING FOR STRUCTURES</u>	251
709	<u>EXCAVATIONS FOR RIVER TRAINING AND NEW WATER COURSES</u>	251
710	<u>STONE PITCHING</u>	251
711	<u>GABIONS</u>	252
712	<u>RIP-RAP</u>	252
713	<u>MEASUREMENT AND PAYMENT</u>	253
714	<u>BACKFILL BELOW STRUCTURES</u>	253
715	<u>FILTER FABRIC</u>	254
<u>SECTION 8 - CULVERTS AND DRAINAGE WORKS</u>		255
804	<u>EXCAVATION FOR CULVERTS AND DRAINAGE WORKS</u>	255
805	<u>EXCAVATION IN HARD MATERIAL</u>	256
809	<u>BEDDING AND LAYING OF PIPE CULVERTS</u>	257
810	<u>JOINTING CONCRETE PIPES</u>	257
812	<u>BACKFILLING OVER PIPE CULVERTS</u>	258
814.1	<u>SUBSOIL DRAINS</u>	258
<u>Section 9 - PASSAGE OF TRAFFIC</u>		259
901	<u>SCOPE OF THE SECTION</u>	259
904	<u>CONSTRUCTION OF DEVIATIONS</u>	261
907	<u>SIGNS, BARRIERS AND LIGHTS</u>	262
909	<u>ASSISTANCE TO PUBLIC</u>	263
911	<u>CONTRACTOR'S CONSTRUCTION TRAFFIC</u>	263
912	<u>MEASUREMENT AND PAYMENT</u>	264

<u>Section 11 – SHOULDERS TO PAVEMENT</u>	267
<u>1101 GENERAL</u>	267
<u>Section 12 - NATURAL MATERIALS FOR SUB-BASE AND BASE</u>	268
<u>1203 MATERIAL REQUIREMENTS</u>	268
<u>1209 MEASUREMENT AND PAYMENT</u>	268
<u>SECTION 13–GRADED CRUSHED STONE FOR SUB-BASE AND BASE</u>	269
<u>1301 DEFINITIONS</u>	269
<u>1303 MATERIAL REQUIREMENTS</u>	269
<u>1303 LAYING AND COMPACTING GRADED CRUSHED STONE SUBBASE AND BASE</u>	270
<u>Section 14 - CEMENT AND LIME TREATED MATERIALS</u>	271
<u>1405 MATERIAL REQUIREMENTS</u>	271
<u>1409 PROTECTION AND CURING</u>	271
<u>SECTION 15 - BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING</u>	272
<u>PART A - GENERAL</u>	272
<u>1501A BITUMINOUS SURFACE TREATMENT</u>	272
<u>1504A HEATING OF BITUMINOUS BINDER</u>	272
<u>1505A ADHESION AGENT</u>	272
<u>1506A CONSTRUCTION LIMITATIONS</u>	272
<u>PART B - PRIME COAT AND TACK COAT</u>	190
<u>1502B MATERIALS FOR PRIME COAT AND TACK COAT</u>	190
<u>1504B SPRAYING OF PRIME COAT AND TACK COAT</u>	190
<u>1506B TOLERANCES</u>	190
<u>PART C - SURFACE DRESSING</u>	191
<u>1502C MATERIALS FOR SURFACE DRESSING</u>	191
<u>1503C SPRAY AND SPREAD RATES OF BITUMEN AND CHIPPINGS</u>	191
<u>1505C PRECOATED CHIPPINGS</u>	191
<u>1506C CONSTRUCTION PLANT FOR SURFACE DRESSING</u>	192
<u>1508C APPLICATION OF SURFACE DRESSING</u>	192
<u>1509C AFTERCARE AND CONTROL OF TRAFFIC</u>	192
<u>1510C TOLERANCES</u>	192
<u>1511C PAYMENT FOR SURFACE DRESSING</u>	193
<u>SECTION 16 - BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES</u>	194
<u>PART A - GENERAL</u>	194
<u>1601A SCOPE</u>	194
<u>1602A REQUIREMENTS FROM OTHER SECTIONS</u>	194
<u>1603A CONSTRUCTION PLANT</u>	194
<u>1605A DESIGN AND WORKING MIXES</u>	195
<u>1606A SITE TRIALS</u>	195
<u>1607A MIXING OF AGGREGATES AND BITUMEN</u>	195

<u>1608A TRANSPORTING THE MIXTURE</u>	196
<u>1609A LAYING THE MIXTURE</u>	196
<u>1610A COMPACTION</u>	197
<u>1611A FINISHING, JOINTS AND EDGES</u>	197
<u>PART B - SUPERPAVE PERFORMANCE GRADE BITUMEN- ASPHALT</u>	
<u>CONCRETE FOR SURFACING</u>	198
<u>1601B INTRODUCTION</u>	198
<u>1602B MATERIALS FOR SUPERPAVE PERFORMANCE GRADE- BITUMEN</u>	
<u>ASPHALT CONCRETE</u>	198
<u>1603B GRADING REQUIREMENTS</u>	200
<u>1604B REQUIREMENTS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN</u>	
<u>ASPHALT CONCRETE</u>	201
<u>1605B MIXING AND LAYING HEAVY DUTY ASPHALT</u>	202
<u>1606B COMPACTION</u>	203
<u>PART C - SUPERPAVE PERFORMANCE GRADE BITUMEN - DENSE BITUMEN</u>	
<u>MACADAM FOR BASE</u>	204
<u>1602C MATERIALS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN</u>	
<u>DENSE BITUMEN MACADAM</u>	204
<u>1603C GRADING REQUIREMENTS</u>	204
<u>1604C REQUIREMENTS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN</u>	
<u>-DENSE BITUMEN MACADAM BASE COURSE</u>	205
<u>1605C MIXING AND LAYING OF SUPERPAVE PERFORMANCE GRADE</u>	
<u>BITUMEN -DENSE BITUMEN MACADAM BASE COURSE</u>	205
<u>1606C COMPACTION</u>	205
<u>Section 17 - CONCRETE WORKS</u>	206
<u>1703 MATERIALS FOR CONCRETE</u>	206
<u>1703, 1704, 1705 CONCRETE WORKS</u>	206
<u>1722 FORMWORK FOR CULVERT WALLS AND SLABS</u>	215
<u>1728 REINFORCING BARS OF WALLS AND SLABS</u>	217
<u>1729 STORAGE OF REINFORCEMENT</u>	218
<u>1730 BENDING REINFORCEMENT</u>	218
<u>1731 FIXING REINFORCEMENT</u>	218
<u>1741 MEASUREMENT AND PAYMENT</u>	219
<u>SECTION 17A - CONCRETE BLOCK PAVING</u>	220
<u>17A/01 GENERAL</u>	220
<u>17A/02 DELIVERY, STORAGE AND HANDLING</u>	220
<u>17A/03 INTERLOCKING CONCRETE PAVERS</u>	220
<u>17A/04 EDGE RESTRAINTS</u>	220
<u>17A/05 BEDDING AND JOINTING MATERIAL</u>	221
<u>17A/06 SUB – LAYER FOR PAVEMENT</u>	222
<u>17A/07 LAYING</u>	222
<u>17A/08 TOLERANCE OF SURFACE LEVEL AND SURFACE REGULARITY</u>	223
<u>17A/09 MEASUREMENT AND PAYMENT</u>	224
<u>SECTION 19 – STRUCTURAL STEELWORK</u>	225

<u>SECTION 20 - ROAD FURNITURE</u>	226
<u>2001 ROAD RESERVE BOUNDARY POSTS</u>	226
<u>2003 EDGE MARKER POSTS</u>	226
<u>2004 PERMANENT ROAD SIGNS</u>	226
<u>2005 ROAD MARKING</u>	226
<u>2005A RAISED PAVEMENT MARKERS – ROAD STUDS</u>	232
<u>2006 GUARDRAILS Under(a) (ii) Posts, add:</u>	234
<u>2007 KERBS</u>	234
<u>2010 TREES</u>	235
<u>2012 RETRO-REFLECTIVE ROAD STUDS “Cats eyes”</u>	235
<u>2013 ROAD HUMPS</u>	235
<u>2014 FLAT TOPPED ZEBRA CROSSING</u>	236
<u>2015 SERVICE DUCTS</u>	236
<u>2016 DUCT MARKER POSTS</u>	236
<u>2017 CULVERT MARKER POSTS</u>	236
<u>2018 BOLLARDS</u>	236
<u>2019 PLOT BOUNDARY BEACONS</u>	237
<u>2020 CHANNEL BLOCKS</u>	237
<u>2021 MEASUREMENT AND PAYMENT OF ITEMS 2012 TO 2020</u>	237
<u>SECTION 22 – DAYWORKS</u>	239
<u>2202 MEASUREMENT AND PAYMENT</u>	239
<u>Section 25 - HIV/AIDS, GENDER ISSUES, SOCIAL ISSUES AND LOCAL PARTICIPATION</u>	245
<u>25 01 SCOPE</u>	260
<u>25 02 INTERPRETATION AND DOCUMENTATION</u>	260
<u>25 03 GENERAL REQUIREMENTS</u>	260
<u>25 04 MEASUREMENT AND PAYMENT</u>	264
<u>APPENDIX TO SECTION 25 OF SPECIAL SPECIFICATIONS</u>	265
<u>SECTION 26 – ROAD SAFETY CAMPAIGN</u>	277
<u>26 01 SCOPE</u>	277
<u>26 02 GENERAL REQUIREMENTS</u>	277
<u>26 03 MEASUREMENT AND PAYMENT</u>	281
<u>SECTION 27 - CONCRETE PILING WORK FOR STRUCTURES</u>	
<u>2701 BRIDGE FOUNDATIONS AND SITE INVESTIGATIONS</u>	
<u>2702 SITE INVESTIGATIONS</u>	
<u>2703 CAST-IN-PLACE REINFORCED CONCRETE FRICTION PILING</u>	
<u>2704 PROOF LOADING AND INTEGRITY TESTING OF PILES</u>	

SECTION 1 – GENERAL

100 SPECIAL SPECIFICATION

Special Specification is supplementary to the Standard Specifications and the two must be read in conjunction. In any case where there appears to be conflict between the two then the Special Specifications will take precedence.

101 LOCATION AND EXTENT OF SITE.

The works comprise of upgrading of Lokichar-Loichangamatak. The project length is approximately 40km. The project starts at Lokichar Centre and proceeds to Loichangamatak centre. The works are in Turkana county.

102 EXTENT OF CONTRACT

(a) General

The Works specified under this Contract shall include all general and ancillary Works and Work of any nature that is deemed necessary for the due and satisfactory construction, completion and maintenance of the Works to the full extent and meaning of the Drawings and Specifications, whilst complying with all Provisions of the Conditions of Contract whether specifically mentioned or not in the clauses of the Specification.

(b) Scope of Works

The Major Works along Lokichar- Loichangamatak (A1) road to be executed under the Contract comprise mainly of but are not limited to the following:

- Provision of accommodation facilities to the Engineer's representatives
- Maintenance of the existing road;
- Site clearance
- Removal of any remaining existing surfacing and base material through cold milling or use of a reclaimer/recycler to scarify existing pavement to prescribed depth in preparation for subgrade preparation.
- Preparation of the subgrade, including improved subgrade in some sections to receive the pavement layers as per the standard specifications.

- Provision of 200mm thick cement improved gravel subbase
- Provision of 175mm cement improved Graded Crushed Stone base to carriageway
- Provision of 75mm DBM surfacing to carriageway and 35mm AC on shoulders
- Provision of double surface dressing using 14/20mm and 6/10mm Class 1 pre-coated chippings to carriageway
- Provision of vehicular accesses, and access culverts from road side properties
- Provision and installation of road furniture as specified.
- Construction of new box/pipe culverts with appropriate inlet and outlet structures and scour protection works.
- Installation of erosion control and erosion protection works;
- Construction of new bridges in reinforced concrete and structural steel works and rehabilitation of existing ones
- Drilling of bore holes for partial provision of water for construction
- Rectification of defects affecting the completed road for a period of 12 months

103 CONTRACT DRAWINGS

Two sets of full sized drawings will be issued to the Contractor, at the commencement of the Contract to facilitate the construction of the Works in complete conformity with and to the full intent of the Contract. Additional copies of these drawings that may be required by the Contractor can be obtained from the Engineer, in which case the Contractor will be required to reimburse the cost of producing such additional copies.

The Engineer may from time to time in order to enable the satisfactory completion of the Works, revise, amend, or supersede any of these drawings. It shall be the Contractor's responsibility to construct all Works in conformity with the latest revision, amendment or superseding drawings, provided that the Engineer has given to the Contractor in writing such reasonable prior notices of intention to revise, amend or supersede as the nature of the intended change requires and the relevant drawings have been issued to the Contractor.

The Contractor may be required to demolish, alter and/or correctly rebuild at his own expense any part of the Works not in conformity with the drawings currently forming part of the Contract at

the time of construction of such Works, provided always that such current drawings had previously been issued to him.

Documents

The following manuals will not be issued with the tender documents but will be available for inspection during normal working hours at the offices of Kenya National Highways Authority.

Road Design Manual:

Part 1: Geometric Design of Rural Roads

Part 3: Materials and Pavement Design for New Roads

Overseas Road Note No. 19

Manual for Traffic Signs:

Part I: Road Markings

Part 2: Informatory Signs, Warning Signs, and Regulatory Signs.

104 PROGRAMME

Add the following sub-clauses.

The Contractor shall provide a time programme required under Clause 8.3.1, of the General Conditions of Contract within 28 days of receipt of the Engineer's Order to commence work. The time programme will include, apart from the Works only, that for Environmental and Social Mitigation (ESMP) and Safety.

The programmes shall be co-ordinated with climatic and other conditions to provide for the completion of the Works in the order and by the time specified.

The Contractor shall carry out the Contract in accordance with the programme agreed with the Engineer, but he shall in no manner be relieved by the Engineer's approval of the programme, of his obligation to complete the Works in the prescribed order and by the prescribed completion

date and he shall from time to time review his progress and make such amendments to his rate of execution of the Works as may be necessary to fulfil his obligations.

107 CERTIFICATE OF COMPLETION

Amend Clause 48 to read Clause 10.2 of the General Conditions of Contract

The minimum length of road for which a certificate of completion will be issued under Clause GC 10.2 shall be 40 km of continuous road when substantially completed. A section will be considered substantially complete when the Engineer has confirmed that most of the work has been executed and safe for public use with only minor works outstanding for the 40 km qualifying section.

108 METHOD OF CONSTRUCTION

Delete the first sentence in the third paragraph and insert instead;

The Engineer's Representative's normal working hours shall be 8 hours from Monday to Friday and 5 hours on Saturday with Sunday set aside for rest.

If the Contractor wishes to execute permanent works outside these hours, he shall meet any extra costs arising thereof in addition to giving a day's notice in writing.

109 NOTICE OF OPERATIONS

Add the following Sub- Clauses:

109.1 Notification Terms

It shall be the Contractor's responsibility to notify the Engineer when any item of Works are completed and ready for approval, and the Contractor shall give sufficient notice to allow control test to be performed.

117 HEALTH, SAFETY AND ACCIDENTS

Add to Sub-Clause 117(c) the following:

In addition to providing, equipping and maintaining adequate first aid stations throughout the Works in accordance with the Laws of Kenya, the Contractor shall provide, equip and maintain adequate first aid and HIV/AIDS preventive materials stations throughout the works all in accordance with the laws of Kenya. Further the Contractor shall regularly conduct hygiene and HIV/AIDS campaigns among his workers. To carry out these tasks effectively, the Contractor shall employ a suitably qualified staff to impartially advise him and the Engineer on all the aspects of safety, health and environment. The Contractor shall allow in his prices and be responsible for the cost of all site safety, Health, Environment and welfare arrangements and requirements.

119 USE OF EXPLOSIVES

The requirements of the Laws of Kenya governing explosives and other requirements and regulations of Government of Kenya and other authorities shall be complied with.

No explosives of any kind shall be used without prior written consent of the Engineer.

-The Contractor shall be solely responsible for the provision, handling, storage and transporting of all explosive ancillary materials and all other items of related kind whatsoever required for blasting.

121 DIVERSION OF SERVICES

Add the following Sub-Clauses;

The Contractor shall acquaint himself with the location of all existing services such as telephone lines, electricity cables, water pipes, sewers etc., before execution of any Works that may affect the services. The cost of determining the location of the existing services together with making good or repairing of any damage caused all to the satisfaction of the Engineer shall be included in the tender rates.

The Contractor shall indemnify the Employer against claims originating from damage to existing services or Works.

Subject to agreement with the Engineer, the Contractor shall be responsible for removal of, alteration and relocation of existing services. The Contractor's work programme shall allow adequate time for the identification and relocation of services.

Such work will be reimbursed at Contractor's actual expenditure plus overhead and profit under appropriate bill items of the Bill of Quantities

124 PROVISION OF LAND

124.1 Land for all Camps Sites including Temporary Works

The Contractor shall make all necessary arrangements with the owners of land required and obtain the Engineer's approval in advance of any arrangements being concluded.

Notwithstanding Clause 124 of the Standard Specification all requirements of land for temporary works and construction purposes shall be to the approval of the Engineer but the Contractor will make all necessary arrangements with the property owners concerned and pay all charges arising there from. On or before completion of the Contract, the Contractor shall remove all temporary works and shall restore all such land to the condition in which it was immediately prior to the occupation thereof as far as reasonable and practicable. No separate payment will be made to the Contractor on account of these items and the Contractor must make due allowance for them in his rates.

The Contractor shall provide Land for all Resident Engineer Staff Houses, Main Office and Main Laboratory.

Notwithstanding Clause 124 of the Standard Specifications, the Contractor shall be required to appoint a competent surveyor, who will liaise with the Engineer on matters related to the demarcation of the existing road reserve, site measurements, removal and reinstatement of existing services.

125 BOREHOLES

Notwithstanding the provisions of clause 125 of the special specifications for water supply, where the contractor shall be required to provide solar powered boreholes for construction work, the contractor shall ensure that the yield of the boreholes is at least 160,000 litres per day.

The contractor shall provide a storage tank of at least 4,000 litres for storage of clean drinking water and shall also provide suitable facilities for collection of water for construction and livestock use.

The location of the boreholes shall be approved by the Engineer.

The contractor shall choose a suitable and appropriate borehole development method to ensure verticality. The drilling of any borehole shall be abandoned if the borehole fails in the verticality test. Abandoned boreholes shall be backfilled as directed by the Engineer at the contractor's cost.

The contractor shall provide capping to the boreholes to seal them against contamination.

Appropriate casing with steel or UPVC shall be provided as shall be directed by the Engineer. Placing of grouting, gravel packing and traps and screens shall be as directed by the Engineer.

Test pumping for yield and draw down procedures shall be proposed by the contractor and approved by the Engineer. The contractor shall maintain daily, monthly and shall also prepare a borehole completion record as shall be directed.

Any negative environmental and social impacts arising from the drilling process shall be mitigated.

Water quality testing shall be conducted at a competent testing laboratory as instructed by the Engineer.

All materials and workmanship shall be the best quality and shall comply with the latest ISO standards

The rate for the borehole shall include hydrogeological survey (for investigating the sweet water aquifer depth and possible yield), drilling, construction of the borehole, equipping it, test pumping, commissioning, maintenance throughout the duration of the project and supply of the water and ascertaining its quality for use in both construction and human consumption.

126 MATERIALS AND MANUFACTURED GOODS

Notwithstanding the provisions of Clause 126 of the Standard Specification, the Contractor's attention is drawn to his obligations with regard to quality and delivery schedule of materials and goods obtained from suppliers. Should the Engineer at any time be dissatisfied with any goods and materials intended for use by the Contractor upon the Works, he shall be empowered to reject the goods and materials and shall order that others of acceptable quality replace them. Any more work that may consequently have to be redone and the costs of the new supplies shall be borne by the Contractor.

127 INFORMATION FROM EXPLORATORY BORINGS AND TEST PITS

Omit the content of Clause 127 and substitute with the following Sub-Clauses: -

127.1 Factual Materials Report

The Factual Materials Report for this Contract does not form part of the Contract Documents. However, the Report will be made available for the *Contractor's information only*, and any conclusions on issues such as suitability of materials, location of borrow pits, material quantities etc., made by the Contractor on basis of the Factual Materials Report, will be at his own risk.

127.2 Trial Sections

The Contractor shall allow in his programme for constructing trial sections and carrying out tests upon them as directed by the Engineer. Trials would normally be required at the start of each pavement layer and if changes of materials, method or equipment deem it necessary as directed by

the Engineer. The time for completion of the Contract shall not be extended because of the time needed to construct trial sections and evaluate the tests on them.

At least fourteen days before the work of laying any pavement layer is commenced, the contractor shall construct trial sections of at least 100 m in length and to the full construction width and the specified pavement layer thickness. For each trial section, the Contractor shall use the materials, mix proportions, mixing, laying, compaction equipment and construction procedure that he proposes to use for the main work. The main work of laying the pavement layer shall not be commenced until this trial has been tested and approved by the Engineer.

No variation in the construction procedure, mix proportions, size, grading or source of any of the constituents shall be made without the agreement of the Engineer who may first require new trial sections to be carried out.

Trial sections, if found satisfactory, will be paid for under the rates in the Bill of Quantities for the appropriate items, as if the trial sections were part of the normal work. No separate payment will be made for trial sections and testing.

The Contractor shall make good, at his own expense; any trial sections that fail to meet the specified standards. The standards shall include, but not be limited to, material quality, layer thickness, levels and compaction.

130 PROGRESS PHOTOGRAPHS

Video Coverage of Progress of Works

Where instructed by the Engineer, the Contractor shall pay for professional video coverage of the works which shall be undertaken immediately upon handing over the site to the contractor and upon completion of works and at frequencies and intervals instructed. The video recording shall include voice track, text and subtitles of works before and during construction and shall be undertaken at intervals instructed by the Engineer.

Two copies of each set of recording in Digital Video Disk (DVD) or similar format shall be delivered to the Engineer within 14 days of recording.

Processing of Digital Photographs

The contractor shall, in addition pay for production, processing and printing of ten (10) copies of digital photographs taken by the Engineer.

131 SIGNBOARDS

The Contractor shall provide and erect two (2) publicity signboards on the site as directed. The Engineer shall, as shown in the Drawings, direct the minimum dimensions of the boards. The signs shall be printed reflective Vinyl Stickers on galvanised steel plates min 350mm high. Posts shall be galvanised steel. Main headings lettering shall be Yellow and min 80mm high, while subheadings lettering shall be White and min 60mm high as per the drawings.

132 HOUSING ACCOMODATION FOR THE RESIDENT ENGINEER AND HIS STAFF AND LABORATORY INCLUDING FURNITURE AND SURVEY EQUIPMENT

Add the following Sub-Clauses:

132.1 Housing Accommodation for the Engineer's Senior Staff

The Contractor shall construct, equip and maintain houses (one for type I and five for type II or equivalent) for the Engineer's senior staff. The Engineer's senior staff houses shall be separate from that of the Contractor's staff housing and shall be sited and constructed to the satisfaction of the Engineer as detailed in the Drawings.

Type I and II Houses shall be in accordance with the book of drawings, and shall be constructed with material to be approved by the Engineer. The Engineer shall approve the design and construction of the same. These houses shall revert to the Contractor at the end of the project. They shall be paid for in accordance with Clause 141 of the Standard Specification, under Bill items 1.01 of the Bill of Quantities.

All material used shall be new, strong, durable and weatherproof. Ceilings and floor must be properly insulated against heat with approved insulated material. The floor shall have a level smooth finish. All windows shall be glass, able to be opened, and with mosquito nets. The building materials shall be mosquito and termite proofed and painted in and outside with two coats of paint/ varnish, all to the approval of the Engineer.

The ceilings of houses and verandas shall be lined with ceiling board. All doors are to be fitted with mortise locks, which must be heavy duty on external doors. All windows shall be fitted with burglar bars.

The roof cladding shall be with G.I. corrugated sheets or equivalent material. The lounge, bedroom, bathroom, toilet and kitchen floor will have cement mortar finish floors. The workbenches in kitchen shall have approved cover. All the sanitary ware shall be vitreous China or equivalent of approved quality.

All houses are to be provided with a fire extinguisher and fire axe. Fire axes are to be secured to the outside of the buildings.

All storerooms shall be fitted with at least 3 substantial shelves and kitchens shall be fitted with shelves, drawers and cupboards as instructed.

The Contractor shall provide new furniture, equipment and fittings as listed herein below. The Contractor should obtain approval of the Engineer for the type and quality of the furniture, fittings and equipment before ordering.

All houses shall be provided with a piped supply of drinkable water, electricity, gas and kerosene for the consumption of the Engineer and his staff and the Contractor shall provide all necessary waterborne sanitation and disposal systems to the satisfaction of the Engineer.

The Contractor shall pay for water, electricity, gas and kerosene consumed, and for the statutory charges associated therewith. The Contractor shall be responsible for rubbish disposal by

providing outside bins and daily collection to a central area located to the satisfaction of the Engineer.

Each type I and II house shall be erected separately. A barbed wire topped chain link wire fence 2 metres high with a chain and padlock lockable gate shall be provided around the general perimeter of the types I and II houses.

Each type I and II house shall be provided with day and night watchmen and security lights, the cost of which shall be deemed to have been included in the rates for the houses.

The senior staff will generally comprise the following:

<u>Designation</u>	<u>Number</u>
Resident Engineer	1
Assistant Resident Engineer (Highway Engineer)	1
Materials/Pavement Engineer	1
Structural/Drainage Engineer	1
Measurement Engineer	1
Engineering Surveyor	1
Environmental Safeguards specialist	1
Health and safety safeguards Specialist	1
Community Liaison Officer (Social safeguards)	1

132.2 Housing Accommodation for Engineer's Junior Staff

The Contractor shall construct, equip, furnish and maintain 6 No. Type III 13 No. Type IV houses and 13 No Type V or equivalent for the Engineer's Junior staff, to be located adjacent to Resident Engineer's offices and laboratory, the location of which will be subject to Engineer's approval.

Junior staff houses shall be temporary and made in durable and weatherproof materials and to a similar standard as the senior staff houses.

House Types III , IV and V including furniture and fittings shall all revert to the Contractor on completion of contract. They shall be paid for in accordance with Clause 141 of the Standard Specification under bill No. 1 of the Bill of Quantities.

This staff will generally comprise the following:

Engineer's junior staff

Ref	Designation	Number of Staff
1	Junior engineer or equivalent	2
2	Senior roads inspector or equivalent	2
3	Roads Inspector or equivalent	2
5	Laboratory technologist or equivalent	1
6	Laboratory technician or equivalent	3
7	Laboratory attendant or equivalent	9
8	Survey assistant or equivalent	2
9	Survey chainman or equivalent	6
10	Draughtsman or equivalent	1
11	Secretary or equivalent	1
12	Office 365 support assistant	1
13	Office attendant or equivalent	1
	TOTAL	31

132.3 List of Equipment for Engineer's Staff Houses

Each house shall be provided with new furniture, equipment and fittings to the approval of the Engineer.

All the houses and furniture mentioned below shall revert to the contractor after the completion of the contract.

Contractor to include in their rates for the houses purchase of all the furniture listed below.

Each house shall be provided with new furniture, equipment and fittings to the approval of the Engineer as listed below:

DESCRIPTION	QUANTITY OF ITEMS PER TYPE OF HOUSE				
	I	II	III	IV	V
1. FURNITURE <i>(reverts to contractor)</i>					
Kitchen table(formica top)	1	1	1	1	1
Kitchen chair	1	1	1	1	1
Dining table	1	1	1	1	1
Dining chairs	6	6	4	4	2
Dining chairs with arms	2	2	1	1	1
Writing desk (3 drawer)	1	1	1	0	0
Book shelf	1	1	1	0	0
Settee - 7 Seater	1	1	0	0	0
Settee - 5 Seater	0	0	1	0	0
Easy chairs	4	4	2	2	1
Coffee tables	1	2	1	0	0
Side board	1	1	1	0	0
Beds double 6x6 with inner spring mattresses	2	1	-	-	-
Beds single 4x6 with inner spring mattresses	1	1	2	1	1
Pillows	8	8	4	2	2
Side tables	4	4	1	1	1
Dressing tables with mirrors	1	2	2	0	0
Dressing table stools	1	2	2	0	0
Chest of drawers	3	2	2	1	1
Bedside chairs	4	2	1	1	1
Bathroom cabinet with mirror	1	1	1	1	1
Bathroom stool	1	1	1	1	1
Floor rags	4	4	4	4	2
2. EQUIPMENT					
Air conditioner	5	4	4	2	1
Refrigerator (at least 19 cu.ft.) including a freeze compartment of about 3 cu. Ft. capacity	1	1	0	0	0
Refrigerator (at least 7 cu.ft.) including a freeze compartment	0	0	1	1	1
Electric & gas cooker with 4 burners, a grill and an oven	1	1	1	0	0
Electric cooker 2 elements	0	0	0	1	1
Gas or electric					
Fume hood	1	1	1	0	0
Water filter (hot and cold dispenser)	1	1	1	1	1
Dust bin metal with lid(outdoor type)	1	1	1	1	1
Door mats	2	2	2	2	2
Vacuum cleaner	1	1	1	0	0
Ceiling fans	2	1	1	1	1
Set of 8 piece crockery, cutlery, glass wear	1	1	1	1	1
Set of kitchen utensils	1	1	1	1	1
Set of pots .pans etc	1	1	1	1	1
Fire extinguisher	2	2	1	1	1
Standard lamps	5	2	1	1	1
Table lamps	1	1	1	0	0
Toilet tissue holders	1	1	1	1	1
Waste baskets	4	4	2	2	1
Mixer electric (portable)	1	1	1	1	1

DESCRIPTION	QUANTITY OF ITEMS PER TYPE OF HOUSE				
	I	II	III	IV	V
Bedside lights	3	2	2	1	0
Wall lights	5	12	7	3	2
Pelmets and runners	LS	LS	LS	LS	LS
Curtains	LS	LS	LS	LS	LS
Bed sheets	16	16	8	8	4
Pillow cases	8	8	4	4	2
Blankets	8	8	4	4	4
Towel rails	2	2	1	1	1

132.3 Offices

a) Main Office

The Contractor shall provide and maintain for the duration of the Contract, a furnished and equipped main office for the Engineer's Representative of durable and weather-proof construction, provided with mosquito-proof and burglar-proof windows and lockable doors and suitably insulated against heat and cold, all to the satisfaction of the Engineer in respect of the construction, design and sitting. The office shall comply with the details shown in the drawings and shall have a clear height of not less than 2.6 m. The floor shall be of floated concrete, and adequately damp- and termite-proof.

A telephone shall also be provided for the Resident Engineer's office for his exclusive use. The Contractor shall be responsible for paying all the charges and fees related to the use of the telephone and be reimbursed the same under the relevant bill item in the Bill of Quantities.

The office for the Engineer's Representative shall be completely separate from that of the Contractor and shall be fenced with a 2m high chain linked fence and gate with padlock and chain.

Toilets and washrooms graded to staff seniority, together with drinkable water supply and water borne sewage disposal, shall be provided for the office. The Contractor shall also provide 24

hours a day electricity supply to the offices and shall allow for any water and electricity consumed and for any statutory charges associated.

Unless the offices are accessible via an existing paved road the Contractor shall also provide an access road at least 3m wide to the office. A 100 square meters covered car parking area. Both access road and car park shall be surfaced with at least 150 mm of consolidated gravel properly graded, cambered and drained.

The offices shall be provided with day and night watchmen and security lights, the cost of which shall be deemed to have been included in the rates for the offices.

b) Mobile office

The Contractor shall, if so instructed by the Engineer, provide, maintain, service, clean, provide security for and light one weatherproof mobile office (caravan type) for the Engineer's staff. The office shall have a floor area of not less than 10 m² and a clear height of not less than 2.25 m and shall be of double roofed tropicalised design. The Contractor shall maintain an adequate supply of potable water and electric power supply to the office. The Contractor shall include in his rates for the moving of this office to different locations along the project road as instructed by the Engineer.

132.4 Laboratory

a) Main laboratory

The Contractor shall construct, and maintain for the duration of the Contract, a laboratory complying with details shown on the standard drawing or equivalent, to the satisfaction of the Engineer. The building shall be of durable and weatherproof materials, provided with mosquito-proof and burglar proof windows and lockable doors, and suitably insulated. The laboratory shall be sited adjacent to the Resident Engineer's main office.

The laboratory shall have piped potable water supply and a continuous electricity supply adequate for lighting, heating and operating the laboratory equipment.

The laboratory shall have a height from floor to ceiling of not less than 2.75 metres and all rooms shall be fitted with electric lighting and power points as instructed by the Engineer's Representative, and each door shall be fitted with a good quality mortise lock and provide with two keys.

Soaking tanks for CBR specimens shall be provided at floor level in the laboratory. Concrete cube curing tanks of adequate size shall also be provided. Both the CBR tanks and concrete cube curing shall have drainage pipes built in.

The following rooms and facilities shall be provided in the Laboratory;

(i) Office

This room shall have a total floor area of not less than 14 square metres and a total window area of not less than 2 square meters. The door and windows shall be fitted with fly screens covered with mosquito gauze. The floor shall be of concrete with a float finish. The walls shall be lined and ceiling provided.

A display board of soft-board or similar approved material shall be provided and fixed securely to the wall at a location to be indicated by the Engineer.

(ii) Main laboratory room

This room shall have a total floor area of not less than 55 m² and a total window area of not less than 7 m². The external entrance shall be a double door and single doors shall be provided for access to adjacent offices.

The permanent fixtures in the Laboratory shall include three double draining board stainless steel sinks, piped potable water supply to each and waste water outlets. The room shall be fitted with three rigidly constructed work benches 0.9 m high by 1 m wide and with a top comprised of

either metal lined hardwood or steel float finished concrete (at least 75 mm thick and suitably reinforced). A total length of workbenches approximately of 15 m shall be provided. Wall shelves 450 mm wide and having a surface area of at least 6 m² shall be provided and securely fitted.

Concrete plinths suitable for mounting the cube crusher and CBR load frame shall also be provided.

Two display boards made of soft-board or other approved material, each with a minimum area of 3 m², shall be securely fixed to the walls as directed by the Engineer.

(iii)Small laboratory room

A small laboratory room shall be provided. This room shall have a total floor area of not less than 20 m² and a total window area of not less than 2 m². A door shall provide access to the main laboratory room. The floor shall be fitted out as indicated by the Engineer's Representative with two rigidly constructed workbenches constructed to the same standard of construction as the main laboratory room. The workbenches shall be at least 6 m long. A sink with waste pipe shall be connected to the water supply of the main laboratory room.-In addition an approved air extractor shall be fitted through an outside wall.

(iv)Store room

A separate sample store, of at least 20 m² floor area and with shelves along one wall, shall be provided in a position to be indicated by the Engineer.

(v)Concrete slab

A concrete slab, 150 mm thick with a total area of not less than 20 m² shall be provided adjacent to the main laboratory building in a position to be indicated by the Engineer's Representative. The slab shall have a smooth finish, all to the satisfaction of the Engineer.

The laboratory shall revert to the Contractor at the end of the contract.

b) Mobile laboratory

The Contractor shall, if so instructed by the Engineer, provide, maintain, service, clean, provide security for and light one weatherproof mobile site laboratory office (caravan type) for the laboratory's staff. The laboratory shall have a floor area of not less than 10 m² and a clear height of not less than 2.25 m and shall be of double roofed tropicalised design. It shall be fitted with a 1000 litres capacity water tank and a generator. The Contractor shall maintain an adequate supply of gas, potable water and electric power supply to the laboratory. The Contractor shall include in his rates for the moving of this laboratory to different locations along the project road as instructed by the Engineer.

132.5 Engineer's office and laboratory furniture

Furniture and equipment for the Engineer's Laboratory shall be as listed in the Bill of Quantities. It shall also be the Contractor's responsibility to replenish consumables, when instructed by the Engineer. The Engineer's office and laboratory furniture will revert to the Contractor on completion of the contract.

132.6 Engineer's laboratory and survey equipment

The Contractor shall provide, install and maintain in a good state of repair for the duration of the Contract, such laboratory, survey and other equipment as listed in the Bill of Quantities. Such equipment shall be of approved manufacture, and shall be made available to the Engineer within the following time periods:

*Survey equipment - not more **than 30 days** after Engineer's order to supply*

*Laboratory equipment - not more **than 60 days** after Engineer's order to supply*

Any delays to the Contractor or the Contractor's activities caused by the Engineer being unable to perform survey work, field or laboratory tests due to the Contractor's failure to supply and/or maintain the said equipment shall be deemed to have been caused by the Contractor's own actions, and any consequences of such delays shall be interpreted as such.

The laboratory and survey equipment shall revert to the Employer on completion of the contract.

132.7 Radio communication equipment

The Contractor shall, if so instructed by the Engineer, provide install and license as necessary a radio communication network for the duration of the contract and for the exclusive use of the Engineer. The communication network shall be complete with all accessories and complete trans-receiver stations for each of the Engineer's staff cars, office and laboratory. The equipment provided shall have a range adequate for mobile units at extreme ends of the site to communicate with each other and/or with the central control. The model and make of the radio communication system shall be approved by the Engineer.

The Contractor shall be responsible for obtaining all necessary permits and licenses needed for the operation of the radio call services. The Contractor shall maintain the equipment in good working condition, including charging of batteries for mobile units.

Failure by the Contractor to provide or maintain the equipment shall make him responsible for all costs that may be incurred as a result of the Engineer's staff using alternative means of communication, including delays in supervision and approval of the works. Ownership of the radio equipment shall revert to contractor at the end of the Contract.

Payment for complying with this requirement is included in the bill of quantities.

132.9 Mobile Communication for the Engineer

Mobile phones

Deleted

Internet and email services

The contractor shall allow for the provision and maintenance of internet connectivity and associated costs as per BoQ Item 1.19

133 TIME FOR ERECTION OF THE ENGINEER'S STAFF HOUSES, OFFICES AND LABORATORY

The time for completion of all housing for the Engineer's office, laboratory, senior and junior staff housing shall be as specified in the Standard Specification.

During the duration from the commencement of period of performance until taking over of the Engineer's houses and office, the Contractor shall provide suitable hotel or rented accommodation and appropriately located temporary office space, all adequately furnished and equipped to the approval of the Engineer.

135 MAINTENANCE OF THE ENGINEER'S STAFF HOUSES, OFFICES, LABORATORIES, FURNITURE AND EQUIPMENT

In 1st paragraph, delete “until the end of the Period of Maintenance” and substitute “till the issue of the Taking Over Certificate for the whole of the Works, and if required for a period thereafter until the Contractor has completed any outstanding work”

Add the following at the end:-

135.1 Provision of Maintenance and Security

The Contractor shall maintain all furniture and equipment provided by him in a usable state of repair and shall replace promptly any item that becomes unserviceable or is lost.

The contractor shall provide cleaners, groundsmen, and day and night watchmen for housing camp and offices as directed or instructed by the Engineer on site, the cost of which shall be included in the rates for providing and maintenance of houses, offices and laboratory. Additional armed security shall also be provided as instructed by the Engineer and payment done under the appropriate item in the Bill of Quantities.

137 ATTENDANCE UPON THE ENGINEER AND HIS STAFF

The costs, for attendance required by this Clause 137, shall be included in the items for maintenance as specified in Clause 135.

138 PROVISION OF VEHICLES AND METHOD OF PAYMENT

All vehicles to be supplied will be brand new, right hand drive, ABS breaking system, air bags, diesel powered and fitted with air-conditioner and power steering as described below:

One (1)-Type 1 new 4WD station wagon vehicles of minimum 4.2-ltr naturally aspirated diesel engine, or equivalent approved, 5 door Utility Vehicle, fitted with driver and passenger air bags, Fm radio and CD player, full air conditioning, anti-theft security system, power steering, independent double wishbone with coil springs and gas hydraulic dumpers as part of the suspension and mobile telephone hands-free headset.

Two (2) -Type 2 new 4WD station wagon vehicles of minimum 3.0-liter turbo-charged Diesel Engine common rail-type or equivalent approved, 6-speed manual transmission, 5 door Utility Vehicle or similar approved, fitted with driver and passenger air bags, AM/FM/CD Player with Bluetooth, 6 Speaker, Power windows, full air conditioning, anti-theft security system, power steering, Double wishbone independent suspension (Coil springs with stabilizer bar) and mobile telephone hands-free headset.

Seven (7) -Type 3 new fully loaded 4WD double cabin Pick Up vehicles of minimum 2.8-liter turbo-charged Diesel Engine drivetrain or equivalent approved, 6-speed manual transmission, Power windows, full air conditioning, anti-theft security system, power steering, AM/FM/CD Player with Bluetooth fitted with mobile telephone hands-free headset.

Three (3)-Type 4 new 4WD Single cabin Pick up vehicles of minimum 2.5 litre diesel engine, or equivalent approved, (with canvas back and seat), fitted with mobile telephone hands-free headset

Should any vehicle supplied not be in road worthy condition, the Contractor shall immediately provide an acceptable equivalent replacement vehicle until such time as the original vehicle is repaired to the satisfaction of the Engineer and returned to use.

Payment for the vehicles shall be by a rate per vehicle month for the provision of vehicles a driver and running cost per vehicle month inclusive of the first 5000 Km and a rate per kilometre for the running costs above the 5000 Km per month which shall include for all fuels, lubricants, servicing insurance, maintenance, driver and repairs necessary to meet roadworthiness and compliance with registration requirements or as shall be instructed by the Engineer. The rates shall include for any overtime or any other allowances the driver might be due.

Ownership of all the vehicles mentioned above shall revert to the Contractor at the end of the contract.

139 MISCELLANEOUS ACCOUNTS

The Contractor may be instructed by the Engineer to provide such items as stationery, stores, furniture and equipment, claims and make payments for allowances for supervision personnel and any miscellaneous claims such as facilitation during official site visits/functions under general receipted accounts. The Contractor will, on provision of receipts, be paid under appropriate items in the Bill of Quantities.

140 PAYMENT OF OVERTIME FOR ENGINEER'S JUNIOR STAFF

Delete in the last line the words "shall be at the Contractor's own expense" and substitute with "including the specified percentage for administrative overheads shall be paid by the Contractor to the Engineer.

Add the following:

If the Contractor wishes to execute permanent work outside the Engineer's normal working hours, as stated in Clause 108 of this Specification, then the payment for the overtime for Engineer's support and Junior staff shall be reimbursed in full by the Contractor to the Engineer.

(ii) If the Contractor wishes to execute permanent works on a regular basis outside the Engineer's normal working hour, (Clause 108 of this Specifications) over a prolonged period, the Engineer may, if he deems it necessary, employ additional Engineer staff for which the required salaries, plus twenty (20) percent additional amount to cover for the Engineer's overheads shall be reimbursed in full by the Contractor to the Engineer and the Contractor shall provide the required accommodation facilities for such staff at his own cost. The Employment of the additional staff for the Engineer will be subject to approval of the Employer.

(iii) Payment of Allowance on Duty Trips

The Contractor is required to pay for hotel accommodation and allowances for his staff seconded to the Engineer on official duty trips outside the base camp.

The Contractor shall not be reimbursed any of these costs.

141 MEASUREMENT AND PAYMENT

Delete Sub-Clause 141 (a) entirely and substitute with:

No Preliminary item has been included in this Contract. All Contractor's mobilization and general costs shall therefore be included in relevant rates in the Bill of Quantities.

To (e): Provision and Maintenance of Housing, Office and Laboratory for the Engineer and his staff.

Replace b (i) (ii) and (iii) with the following:

The Contractor shall be paid in the following manner:

50% (fifty percent) of the sum when the housing, office and laboratory, as appropriate, have been erected, furnished, equipped, accepted and handed over to the Engineer.

50% (fifty percent) of the sum in equal monthly instalments spread over the period from the date when the houses, offices, or the laboratory as appropriate is taken over by the Engineer until the end of the Contract excluding the defects liability Period.

Maintenance of accommodation for Engineer's staff shall be paid separately under BoQ item 1.02.

This payment shall be deemed to cover servicing and maintenance of buildings, furniture, equipment and services and the Engineer may withhold or reduce any payment if the Contractor fails in his maintenance obligations. In the event of the Interim Certificate not being issued in any month, then the due payment shall be added to the subsequent certificate.

142 ENVIRONMENTAL PROTECTION AND WASTE DISPOSAL

The contractor shall ensure so far as reasonably practicable to the satisfaction of the Engineer that the impact of the construction on the environment shall be kept to a minimum and that appropriate measures are taken to mitigate any adverse effects during construction.

After extraction of materials, all borrow pits shall be back-filled to the satisfaction of the Engineer. In particular borrow pits near the project road shall be backfilled in such a way that no water collects in them. However, if a borrow pit is located at such a site where water that may collect in can be used by the local people without creating conflict, then such borrow pits could be improved to remain as a water pan up on completion of works. The Engineer's Representative will issue instructions regarding such borrow areas during the time of construction.

142.1 Landscape Preservation

(a) General

The Contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the Works. Except where clearing is required for permanent works, approved construction roads or excavation operations, all trees, native shrubbery and vegetation shall be preserved and shall be protected from damage by the Contractor's construction operations and equipment. The edges of clearing and cuts through trees, shrubbery and vegetation shall be irregularly shaped to soften the undesirable visual impact of straight lines. Movement of labour and equipment within the right-of-way and over routes provided for accesses to the Work shall be performed in a manner to prevent damage to grazing land, protected areas, crops or property.

Except as otherwise provided in Section 5 of the Specification, special reseeding or replanting will not be required under these specifications; however, on completion of the Work, all work areas not seeded shall be scarified and left in a condition which will facilitate natural re-vegetation, provide for proper drainage and prevent erosion. All unnecessary destruction, scarring, damage or defacing of the landscape resulting from the Contractor's operations shall be repaired, replanted, reseeded or otherwise corrected and directed by the Engineer and at the Contractor's expense.

(b) Construction Roads, Access Roads and Haulage Routes

The location, alignment and grade of construction roads shall be subject to approval of the Engineer. When no longer -required by the Contractor, construction roads shall, if required by the Engineer, be restored to the original contour and made impassable to vehicular traffic. The surfaces of such construction roads shall be scarified as needed to provide a condition which will facilitate natural re-vegetation, provide for proper drainage and prevent erosion.

(c) Construction Facilities

The Contractor's workshops, office and yard area shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. On abandonment, all temporary buildings, including concrete footings and slabs and all construction materials and debris shall be removed from the site. The area shall be re-graded, as required, so that all surfaces drain naturally, blend with the natural terrain and are left in a condition that will facilitate natural re-vegetation, provide for proper drainage and prevent erosion.

(d) Blasting Precautions

In addition to any requirements of local regulations, the Contractor shall adopt precautions when using explosives, which will prevent scattering of rocks, stumps or other debris outside the Work area and prevent damage to surrounding trees, shrubbery and vegetation or harm to persons and personnel in the work area. Blasting should be done during the day, and residents within the vicinity of the blast site should be given ample warning including the time and date of the blasting operation.

142.2 Preservation of Trees and Shrubbery

(a) Preservation

All trees and shrubbery which are not specifically required to be cleared or removed for construction purposes shall be preserved and shall be protected from any damage that may be caused by the Contractor's construction operations and equipment. The Contractor shall plant trees at locations defined by the Engineer and special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, blasting, excavating, dumping, chemical damage or other operations; and the Contractor shall adequately protect such trees by use of protective barriers or other methods approved by the Engineer. The removal of trees or shrubs will be only after prior approval by the Engineer.

The layout of the Contractor's construction facilities such as workshops, warehouses, storage areas and parking areas; location of access and haul routes; and operation in borrow and spoil areas shall be planned and conducted in such manner that all trees and shrubbery not approved for removal by the Engineer shall be preserved and adequately protected from either direct or indirect damage by the Contractor's operations.

Except in emergency cases or when otherwise approved by the Engineer, trees shall not be used for anchorages. Where such use is approved, the trunk shall be wrapped with a sufficient thickness of approved protective material before any rope, cable or wire is placed.

(b) Repair or Treatment of Damage

The Contractor shall be responsible for injuries to trees and shrubs caused by his operations. The term "injury" shall include, without limitation, bruising, scarring, tearing and breaking of roots, trunk or branches. All injured trees and shrubs shall be repaired or treated without delay, at the Contractor's expense. If damage occurs, the Engineer will determine the method of repair or treatment to be used for injured trees and shrubs as recommended and undertaken by an

experienced horticulturist provided by and at the expense of the Contractor. All repairs or treatment of injured trees shall be performed at the expense of the Contractor.

142.3 Prevention of Water Pollution

(a) General

The Contractor's construction activities shall be performed by methods that will prevent entrance or accidental spillage, of solid matter, contaminants, debris and other pollutants and wastes into streams, flowing or dry water courses, lakes and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts and thermal pollution and siltation from eroded areas scarred by the earth works and excavated surfaces. De-watering work for structures foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses shall be conducted in a manner to prevent muddy water and eroded materials from entering the streams or watercourses by construction of intercepting ditches, bypass channels, barriers, settling ponds or by other approved means. Excavated materials or other construction materials shall not be stockpiled or deposited near or on stream banks, lake shorelines or other watercourse perimeters where they can be blown away or washed away by high water or storm runoff or can in any way encroach upon the watercourse itself.

Waste water from aggregate processing, concrete batching, or other construction operations shall not enter streams, watercourses or other surface water without the use of such turbidity control methods as settling ponds, gravel-filter entrapment dykes, approved flocculating processes that are not harmful to fish, recirculation systems for washing of aggregates or other approved methods. Any such wastewater discharged into surface waters shall contain the least concentration of settleable material possible. For the purpose of these Specifications, settleable material is defined as that material which will settle from the water by gravity during a 1-hour quiescent detention period.

(b) Compliance with Laws and Regulations

The Contractor shall comply with all applicable Kenyan Laws, orders, regulations and water quality standards concerning the control and abatement of water pollution.

142.4 Abatement of Air Pollution

The Contractor shall comply with applicable Kenyan laws and regulations concerning the prevention and control of air pollution.

Notwithstanding the above in conduct of construction activities and operation of equipment, the Contractor shall utilize such practicable methods and devices as available to control, prevent and otherwise minimize atmospheric emissions or discharges of air contaminants.

Such practicable methods and devices include transport of water over long distances in tanks and/or water are deemed to extraction from new boreholes, as necessary to meet the applicable laws and regulations.

Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.

Burning of materials resulting from clearing of trees and brush, combustible construction materials and rubbish will be permitted only when atmospheric conditions for burning are considered favourable and when authorised by the Engineer. In lieu of burning, such combustible materials may be disposed of by other methods as provided in Sub clause 142.9 hereof. Where open burning is permitted, the burn piles shall be properly constructed to minimise smoke and in no case shall unapproved materials, such as tires, plastics, rubber products, asphalt products or other materials that create heavy black smoke or nuisance odours, be burned.

142.5 Dust Abatement

During the performance of the work required by these Specifications or any operations appurtenant thereto, whether on the right-of-way provided by the Employer or elsewhere, the Contractor shall furnish all the labour, equipment, materials and means required and shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance and to prevent dust which has originated from his operations from damaging crops, orchards, cultivated fields and dwellings or causing a nuisance to persons. The Contractor will be held liable for any damage resulting from dust originating from his operations under these Specifications on the right-of way or elsewhere. The Engineer may direct sprinkling or other measures for dust abatement if necessary to obtain adequate control.

The cost of complying with this paragraph shall be included in the prices tendered in the Bill of Quantities for other items of Work.

142.6 Noise Abatement

The Contractor shall comply with applicable Kenyan laws, orders and regulations concerning the prevention, control and abatement of excessive noise. The movement of heavy vehicles should be restricted to working hours.

142.7 Preservation of Historical and Archaeological Data

Should the Contractor or any of his employees in the performance of his contract discover evidence of possible scientific, prehistorical or archaeological data, he will notify the Engineer immediately giving the location and nature of the finding. Written confirmation shall be forwarded within 2 days. The Contractor shall exercise care so as not to damage artifacts or fossils uncovered during excavation operations and shall provide such co-operation and assistance as may be necessary to preserve the finds for removal or other disposition by the Employer.

Where appropriate by reason of a discovery, the Engineer may order delays in the time of performance or changes in the Work or both. If such delays or changes or both are ordered, the time of performance and Contract Price shall be adjusted in accordance with the applicable Article 28 and 35 in the General Conditions.

The Contractor shall insert this Sub-Clause in all Subcontracts, which involve the performance of Work on the terrain of the site.

142.8 Pesticides

Pesticides include herbicides, insecticides, fungicides, rodenticides, pesticides, surface disinfectants, animal repellants and insect repellants. Should the Contractor find it necessary to use pesticides in Work areas of this contract, he shall submit his plan for such use to the Engineer for written approval. The Contractor shall read and comply with all labelling requirements when using pesticides.

The cost of complying with this Sub-Clause shall be included in the prices tendered in the Bill of Quantities for other items of Work.

142.9 Cleanup and Disposal of Waste Materials

(a) Cleanup

The Contractor shall, at all times, keep the construction area, including storage areas used, free from accumulations of waste materials or rubbish. All waste water and sewage from office, residential and mobile camps shall be piped to soak pits or other disposal areas constructed in accordance with local government regulations, and where and when such regulations require it, the Contractor shall obtain a permit or other appropriate documentation approving the disposal methods being used.

All used fuels, oils, other plant or vehicle fluids and old tyres and tubes shall be collected to a central disposal point, on a regular basis and disposed of as specified below or instructed by the Resident Engineer.

All household, office, workshop and other solid waste shall be collected to a central disposal area, on a daily basis and disposed in a manner approved by the Engineer.

Servicing of plant, equipment and vehicles shall whenever possible be carried out at a workshop area. This workshop area shall be equipped with secure storage areas for fuels oils and other fluids constructed in such a way as to contain any spillages which may occur and similar storage where used fluids can be stored securely prior to their disposal.

When servicing of plant, equipment and vehicles is carried out away from the workshop area it shall be done at locations and in such a manner as to avoid spillage and contamination of streams and other drainage courses. Any spillages shall be cleaned up by either burning in place or collecting the contaminated soils and burning them at the central disposal area, all to the satisfaction of the Engineer.

Prior to completion of the Work, the Contractor shall remove from the vicinity of the Work all plant facilities, buildings, rubbish, unused materials, concrete forms and other like material, belonging to him or used under his direction during construction. All Work areas shall be graded and left in a neat manner conforming to the natural appearance of the landscape as provided in Sub-Clause 142.1.

Any residue deposited on the ground from washing out transit mix trucks or any similar concrete operations shall be buried or cleaned up in a manner acceptable to the Engineer. In the event of the Contractor's failure to perform the above work, others may perform the work at the expense of the Contractor, and his surety or surety shall be liable therefore.

(b) Disposal of Waste Material

(i) General

Waste materials including, but not restricted to, refuse, garbage, sanitary wastes, industrial wastes and oil and other petroleum products, shall be disposed of by the Contractor in accordance with applicable national laws of Kenya. Disposal of combustible materials shall be by burying, where burial of such materials is approved by the Engineer; by burning, where burning of approved materials is permitted; or by removal from the construction area. - Disposal of non-combustible materials shall be by burying, where burial of such materials is approved by the Engineer, or by removal from the construction area. Waste materials removed from the construction area shall be dumped at an approved dumping site.

(ii) Disposal of Material by Burying.

Only materials approved by the Engineer may be buried. Burial shall be in pits the location, size and depth of which shall be approved by the Engineer. The pits shall be covered by at least 0.6 m of earth material prior to abandonment.

(iii) Disposal of Material by Burning

All materials to be burned shall be piled in designated burning area in such a manner as will cause the least fire hazards. Burning shall be thorough and complete and all charred pieces remaining after burning, except for scattered small pieces, shall be removed from the construction area and disposed of as otherwise provided in this Sub-Clause.

All burning activities are to be supervised. The Contractor shall, at all times, take special precautions to prevent fire from spreading beyond the piles being burned and shall be liable for any damage caused by his burning operations. The Contractor shall have available, at all times, suitable equipment and supplies for use in preventing and suppressing fires and shall be subject to all laws and regulations locally applicable for pre-suppression, suppression and prevention of fires.

(iv) Disposal of Material by Removal

Material to be disposed of by removal from the construction area shall be removed from the area prior to the completion of the Work under these Specifications. All materials removed shall become the property of the Contractor.

Materials to be disposed of by dumping shall be hauled to an approved dump. It shall be the responsibility of the Contractor to make any necessary arrangements with private parties and with local officials pertinent to locations and regulations of such dumping. Any fees for charges that are to be paid for dumping of materials shall be paid by the Contractor and shall be included in the prices tendered in the Bill of Quantities for other items of Work.

(c) Water resource use

The contractor shall not use the existing water sources, both surface and groundwater, to the detriment of the existing community. Since it will be essential for the contractor to construct their own boreholes to meet their needs, caution is required. If borehole water is used in large quantities a record will be kept of the ground water level in the surrounding of the borehole and sufficient care will be given to avoid any effect on other boreholes used by surrounding local communities. The water table level will be reported in the Contractor's Journal and continuation of pumping will be subject to the engineer's approval. The Contractor is encouraged to ensure that the water quality of the borehole be maintained over the life of his use of the facility, with appropriate measures to isolate it from run-off draining down into it. This will facilitate leaving the borehole operational for local community use after decommissioning of the road construction camp. However, before leaving any borehole or other water sources for local community use, the Contractor should liaise with both the local community leaders and the administration to ensure that the location of the water source will not bring about intra- or inter-community conflict. Where such conflict is inevitable, the contractor, in close consultations with the engineer, local leaders and administration, will be required to decommission the water source or alternatively provide an equivalent water source to adjacent communities.

(d) Hunting and other Use of Natural Resources:

The Contractor is required to prohibit his workers from hunting, trapping, killing or other use of natural resources (with the exception of vermin) on the site or on adjacent lands.

The Contractors must develop a code of conduct to ensure that their workers do not consume game meat from the area, whether supplied by the locals or killed by themselves

Intense construction activities must not be undertaken at night within or close to the National Park

Both solid and liquid waste including empty containers should be managed in such a manner as to avoid exposing wildlife to possible poisoning or disease infection. Empty containers should not be strewn carelessly but disposed of in a responsible manner

(v) Fuelwood or charcoal as well as rustic construction wood required for fencing or general construction should preferably be harvested in a controlled manner, and clear felling of trees or shrubs in an area should be forbidden.

(d) Other requirements

The contractor is responsible for providing his own source of water and fuel required for construction purpose and running its project camps. The contractor is expressly forbidden from drawing water for construction purposes from existing public water supply infrastructure.

After extracting material from borrow areas and gravel sources and after approval by the Engineer, the contractor shall shape the gradient of the sides to not more than 1:2 gradient and level the bottom of the excavation and shall allow the depression to become a water holding pond for use by the local community in future.

For any borrow areas and gravel sources not approved by the Engineer for conversion to water pans, they shall be backfilled to the satisfaction of the Engineer immediately after use. In particular, borrow pits near the project road shall be backfilled in such a way that no water collects in them.

The Contractor shall ensure that his Environmental Management Plan prepared under this clause of the Specifications fully incorporates the requirements of his Environmental and Social Mitigation Plan submitted at the time of tender and subsequently incorporated into the contract.

The Contractor shall have environmental safeguards specialist, Health and safety safeguards specialist and social safeguards specialist as part of the key staffs at all times.

The contractor shall comply with all requirements of the Occupational and Health Safety Act and other applicable labour safeguard regulations. The contractor shall take cognizance that livestock rearing is a primary economic activity in the project area and will endeavour to promote and not to adversely impact this activity in his day to day operations.

142.10 Measurement and Payment for Environment Protection and Waste Disposal

Except as specifically included in the Bill of Quantities or otherwise provided above, no separate measurement or payment will be made for any work included in this Clause, and relevant cost of all these requirements shall be included by the Contractor in his rates in the Bill of Quantities for other items of Work.

143 MONITORING OF RAINFALL AT THE SITE

Project rain gauges shall be installed at the Engineers laboratory. All readings shall be taken by the Engineers staff on a daily basis and shall constitute the official project rainfall records.

SECTION 2 - MATERIALS AND TESTING OF MATERIALS

202 TESTING BY THE CONTRACTOR

Add the following:

202.1 Contractor's Testing

The provision of the Engineer's laboratory and testing equipment, as specified in Section 1 of this Special Specification, does not relieve the Contractor of his obligation to provide laboratory and testing equipment and execute his own testing, in conformity with the specified requirements in the Standard Specification.

205 SOILS AND GRAVEL

Whenever in the Contract Document a minimum California Bearing Ratio (CBR) is specified, the CBR of the material shall be determined at the specified state of compaction after four days soaking in the case of neat materials, and after seven days curing plus seven days soaking in the case of cement or lime improved materials.

228 WORKMANSHIP AND QUALITY CONTROL

The Contractor shall, not later than 4 weeks after the notice to commence the Works, submit a project specific Quality Management System, including the Work Method Statements and Quality Audit for major items of work, showing how all the Contractor's systems will ensure that all the works will conform to the Contract documents. The onus rests with the Contractor to produce work which conforms in quality and accuracy of detail to all the requirements of the Specifications and Drawings, and the Contractor shall, at his/her own expense, institute a quality control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians and other technical staff, together with all transport, instruments and equipment, to ensure adequate supervision and proper control of the Works at all times. The Contractor shall provide chainmen and labourers as necessary for the Engineer to carry out checks on the Works.

The Contractor shall conduct tests or have them conducted continually on a regular basis, to check the properties of natural materials and processed natural materials and of products manufactured on the site, such as concrete and asphalt. The Contractor shall remain fully responsible for any defective material or equipment provided by him. Similarly, the quality of all elements of the Works shall be checked on a regular basis so as to ensure compliance with the specified requirements.

The intensity of control and of tests to be conducted by the Contractor in terms of these obligations shall be adequate to ensure that proper control is being exercised.

Where any natural materials or products made from natural materials are supplied, and upon completion of each element of the construction work, the Contractor shall test and check such materials, products and/or elements for compliance with the specified requirements and shall submit his results to the Engineer for approval. Such submission shall include all his measurements and test results and shall furnish adequate proof of compliance with the specified requirements.

No specific pay items are provided as compensation for the above obligations, including the provision of all samples delivered to the Engineer, the repair of places from which samples were taken, and the provision of the necessary personnel and testing apparatus and facilities, for which compensation shall be included in the bid rates of the Contractor for the various items of work to which these obligations apply.

The Contractor shall submit to the Engineer for examination, the results of all relevant tests, measurements and levels indicating compliance with the Specifications on completion of every part of the Work.

SECTION 3 - SETTING OUT & TOLERANCES

301 SETTING OUT

Add the following to (a) General

If the traverse points to be used for the setting out are close to the existing carriageway and interfere with construction works then the Contractor will have to relocate them to a location where they will not be disturbed. The co-ordinates and heights of all traverse points so located shall be listed and provided to the Engineer for checking and/or approval. Contractor shall also monument the new centreline every 200m along straight and all salient points along curves by a pin in the concrete beacon before commencement of any works.

The reference points to define the road reserve shall have 12 mm diameter steel pins embedded in concrete, 200 mm long with 25 mm exposed to the air, sticking out from its top surface. This pin shall be co-ordinated and heighted and result of the same shall be provided to the Engineer for approval. Cost of these works shall be included in the rates, as no separate item has been provided.

Commencement of the Works shall not be permitted until this basic survey data has been provided and approved by the Engineer for at least 5 km of the road.

Add the following to (b) Detailed Setting Out

Reference pegs shall be 50 mm by 50 mm in section 600 mm long driven 400 mm firmly into the ground and painted white above the ground. The offset from centreline shall be indicated by a small nail 20 mm to 25 mm long with its head driven flush with the top of the peg. Chainages, offset and reference elevation shall be clearly indicated on the sides of the pegs to the satisfaction of the Engineer.

After cutting of benches and prior to commencement of earthworks or subgrade works, the Contractor shall take cross-sections again and submit the copy of the same to the Engineer for

agreement. These cross-sections shall then be used as basis of measurement for all subsequent layers, unless otherwise stated.

302 TOLERANCES

Add the following:

(j) Pavement Widths

For Pavement widths for subbase, base and binder course, the allowable tolerances shall be -0 to +50 mm.

(k) Pipe Culverts

The maximum deviation from the specified line of a drainage pipe shall be: -

Horizontal - 20 mm in 3.0 m

Vertical - 30 mm in 10.0 m

SECTION 4 - SITE CLEARANCE AND TOP SOIL STRIPPING

401 SITE CLEARANCE

Site Clearance shall be carried out as directed by the Engineer.

Add the following as the last paragraph in Sub-clause (a):

Site clearance is not required over the paved or gravelled width of existing road and shoulders. No measurement and payment for site clearance will be made for this width. The remaining area within the road reserve including sides of existing embankments and cuttings shall be cleared as instructed by the Engineer. This operation shall also include the removal of all trees, except for some trees as directed by the Engineer. The Contractor shall provide paint and all the assistance the Engineer may require to mark the trees which should not be removed during site clearance.

The Contractor shall take care not to uproot or damage trees which are within the road reserve but outside the construction width. After the Contractor has staked out the extent of the road, the Engineer, with the assistance of the Contractor, shall mark out the trees to be removed. After removal, the trunks and branches of these trees shall be cut up into pieces not more than 2.0m in length, transported and neatly stored at the nearest Ministry of Roads camp or otherwise in a position to be indicated by the Engineer. No additional payment shall be made for complying with these requirements and it is deemed the Contractor will have included its cost in the rates for site clearance.

402 REMOVAL OF TOPSOIL

Topsoil shall include removal of up to 200mm depth of any unsuitable material as directed by the Engineer.

403 REMOVAL OF STRUCTURES, FENCES AND OBSTRUCTIONS

When instructed by the Engineer, the Contractor shall demolish or remove any structure. Measurements for the works shall be done on dayworks basis and payments made under the appropriate item in the Bills of Quantities.

SECTION 5 - EARTHWORKS

503 CLASSIFICATION OF MATERIAL

Add the following to (a) Hard material:

Hard materials include materials which require drilling and blasting

Add the following to (b) Soft material:

Unsuitable materials include:

- (i) All material containing more than 5% by weight of organic matter (such as topsoil, material from swamps, mud, logs, stumps and other perishable material)
- (ii) All material with a swell of more than 3%.
- (iii) All clay of plasticity index exceeding 45 or of liquid limit exceeding 70.
- (iv) All material having moisture content greater than 105% of optimum moisture content (AASHTO T99)

504 PREPARATION PRIOR TO FORMING EMBANKMENTS

Add the following at the end:

Where benching is required for existing pavement or embankment slopes to accommodate earthworks, subgrade or subbase for widening the road, the rate for compaction of existing ground shall be deemed to cover this activity.

Excavation in the pavement of the existing road shall be kept dry. In the event of water penetrating the underlying layer, construction of the subsequent layers shall be postponed until

the underlying layers are dry enough to accommodate the construction plant without deforming or otherwise showing distress.

Step construction shall be carried out per layer at the joint where excavating both vertically and perpendicular to the direction of the travel. The step shall be 500 mm perpendicular to the direction of the travel and 150 mm vertical unless otherwise instructed by the Engineer.

Special care shall be taken when compacting the new material at the joint ensuring that specified density is achieved.

505 CONSTRUCTION OF EMBANKMENTS

Fill Material

Only material approved by the Engineer shall be used for fill in new embankments.

Material with high swelling characteristics or high organic matter content shall not be used, unless specifically directed by the Engineer.

Unsuitable materials are defined at 503 (b) It includes expansive soils.

Removal and replacement of expansive soils

The requirements for the backfill shall be as follows:

Permeability: Coefficient of saturated permeability (k) not to exceed 5×10^{-7} cm/sec at 95% AASHTO T99 or the anticipated or actual field density, when tested according to AASHTO T 215 or another approved method using a similar grading to that achieved on the road after compaction. The permeability shall also be checked on the road using a suitable field test at least at each change of material.

Atterberg limits and grading (after compaction):

Maximum Size: 75mm or 0.4 of compacted layer thickness, whichever is the greater

Liquid limit: 25-45

Plasticity Index: 10 (12 preferred) – 25 (20 preferred)

Weighted Plasticity PI: 500-2000%

Casagrande plot: above the A-line

Material passing the 75µm: 8-15 minimum, depending on grading

CBR at 100% AASHTO T99: >12%

CBR swell at 100% AASHTO T99: <1%

Compaction shall be in 150 or 200 mm lifts of compacted thickness to at least 95% (AASHTO T 99) in general and at least 100% in the upper 150-200mm. The maximum compacted thickness shall additionally be limited to two-thirds of the length of the feet of any tamping roller used.

Stockpiling of expansive soils

All expansive soils excavated from the road prism and from beneath embankments positions shall, insofar as practicable, be used for the flattening of slopes to embankments as shown on the drawings or as directed by the Engineer.

The Contractor shall not dispose of any excavated material from the road prism without the approval of the Engineer. Excavated material, which is unsuitable for use in any part of the works shall be disposed of at points approved by the Engineer and in a manner satisfactory to him.

Expansive soils to be reserved for later use in flattening the slopes of the embankment shall be loaded, transported and temporary stockpiled longitudinally and on both sides of the proposed road in approximate equal quantities, as ordered by the Engineer.

The Engineer will, in ordering the locations for temporary stockpiling of expansive soils, ensure that full and free access to the works area will be maintained at all times.

Subgrade

Subgrade shall mean the upper 300 mm of earthworks either insitu or in fill. Subgrade shall be provided for as part of the earthworks operation and payment shall be made as "fill". The material for subgrade in road widenings or reconstruction shall have a CBR of not less than

15% measured after a 4-day soak in a laboratory mix compacted to a dry density of 100% MDD (AASHTO T99).

Improved Subgrade Material

Improved subgrade material shall be provided of minimum CBR value 15%. This material may be obtained from selection of earthwork materials during earthwork operations or natural gravel borrow pits. Improved subgrade material shall be compacted to 100% MDD AASHTO T99 at optimum moisture content. The thickness of improved subgrade to be applied shall be as shown on the Drawings or as instructed by the Engineer.

508 COMPACTION OF EARTHWORKS

At pipe culverts, all backfill and fill above ground level around the culverts shall be compacted to a density of 100% MDD (AASHTO T 99) up to the level of the top of the pipes or top of the surround(s), if any and for a width equal to the internal diameter of the pipe on either side of the pipe(s) or surround(s) as applicable.

At locations adjacent to structures, all fill above ground level up to the underside of the subgrade shall be compacted to density of 100% MDD (AASHTO T 99). In case of fill around box culverts this should be carried out for the full width of the fill and for a length bounded by the vertical plane passing through the ends of the wing walls.

Notwithstanding the provision of clause 503 of the Standard Specification, Compaction of subgrade material (i.e. material immediately below formation) in cut areas shall not be carried out by the contractor in areas where the formation is formed in hard material, unless specific instructions to the contrary are issued by the Engineer.

Where improved sub-grade material shall be required, this shall be compacted and finished to the same standards and tolerances as those required for normal subgrade. Clauses in the Specifications applying to normal subgrade shall also apply.

509 MASS-HAUL DIAGRAM

Delete Clause 509 entirely and substitute

“No Mass-Haul diagram has been provided with the Documents. The Contractor shall be responsible for locating suitable materials for constructing earthworks along the alignment and elsewhere and shall include in his rates for fill, spoil and for the cost of haulage”.

511 BORROW PITS

Replace the first two paragraphs by the following:

Fill material which is required in addition to that provided by excavation shall be obtained from borrow pits to be located and provided by the Contractor and approved by the Engineer.

517 MEASUREMENT AND PAYMENT

Notwithstanding the provisions of clause 517 of the Standard Specifications, the rate for compaction of fill in soft material shall allow for the requirements of Clause 508 of this Special Specification and no extra payment shall be made for compaction to around pipe culverts (100% MDD AASHTO T.99).

SECTION 6 - QUARRIES, BORROW PITS, STOCKPILES AND SPOIL AREAS

601 GENERAL

Notwithstanding any indications to the contrary in the Standard specification the Engineer will not make available to the Contractor any land for quarries, borrow pits, stockpiles and spoil areas, except for those areas in road reserves specifically approved by him.

The contractor will be entirely responsible for locating suitable sources of materials complying with the Standard and Special Specifications, and for the procurement, Wining, haulage to site of these materials and all costs involved therein. Similarly, the contractor will be responsible for the provision and costs involved in providing suitable areas for stockpiling materials and spoil dumps. Should there be suitable sites for spoil dumps or stockpiles within the road reserve forming the site of the works the Contractor may utilise these subject to the approval of the Engineer.

No additional payment will be made to the Contractor to cover costs arising from the requirements for this Clause and the Contractor must include these costs in the rates inserted into the Bills of Quantities.

603 PROVISION OF LAND

Add to Clause 603 after the last paragraph:

The Employer will not make available to the Contractor any land for quarries, borrow pits not shown to the Contractor at the time of tender, stockpiles and spoil areas, except for those areas in road reserves specifically approved by him.

The Contractor will be entirely responsible for locating suitable sources of materials complying with the Specifications, and for the procurement, winning and haulage to site of these materials

and all costs involved therein. Similarly the Contractor will be responsible for the provision of stockpile areas and spoil dumps. Should there be suitable sites for spoil dumps or stockpiles within the road reserve forming the site of the Works, the Contractor may utilize these subject to the approval of the Engineer.

No additional payment will be made to the Contractor to cover costs arising from the requirements for this Clause and the Contractor must include these costs in the rates inserted into the Bill of Quantities.

605 SAFETY AND PUBLIC HEALTH REQUIREMENT

Add the following to Clause 605:

When working the material sites, the Contractor shall time and arrange his works in such a way that at no times the public safety is endangered in any way.

607 SITE CLEARANCE AND REMOVAL OF TOPSOIL AND OVERBURDEN

Add the following to Clause 607:

Faces of quarries being higher than 4 metres shall be shaped sloping 1:10 out of the face. All quarries and borrow pits shall be permanently fenced with 5 strand barbed wire which shall be located 5 metres off the edge of the face. After reinstatement, the bottom of a quarry shall be covered with 0.20 m of soil and 0.15 m of topsoil.

611 OPENING AND WORKING OF BORROW PITS

(a) Clearing and Grubbing, Topsoil and Overburden

The Contractor's rate for borrowed material must include for clearing and grubbing and the removal of topsoil and overburden. No separate payment will be made for this work.

(b) Excavation of Borrow Material

Where any borrow pit contains different types of materials, in separate layers which require to be mixed in order to produce a suitable product, the materials shall be excavated over the full depth of approved face in one operation without separation of the different types of material.

The Contractor shall exercise all reasonable care so as to avoid contamination of approved borrow material by the inclusion of clayey or otherwise unsuitable material from the floor of the borrow pit, from overburden, from unsuitable layers or from areas beyond the approved limits of the borrow area. During loading hard oversize material which will not break down during processing on the road shall be excluded as far as is practicable.

During the course of borrow operations and especially when excavating near the floor and outer boundaries of borrow areas, the Contractor shall plan his operations so as to reduce as far as possible the amount of earthmoving that will be necessary for the reinstating of borrow pits. Indiscriminate excavation without due regard for the desired final shape of the borrow pit will not be permitted.

The material in borrow pits shall be blasted or ripped and/or excavated in a manner that will ensure the effective breaking down of the material in the borrow pit before it is loaded. Rippable material which tends to break into large blocks shall be cross ripped.

(c) Quality Control at Borrow Pit

The Contractor shall be responsible for controlling his operations at every borrow pit where material is being excavated, to ensure compliance with the requirements of Sub-section (b) above.

He shall carry out sufficient tests on the material being excavated from the borrow pit in order to satisfy himself that the quality of the material will comply with the specified requirements for the particular layer for which it will be used.

(d) Protection of Borrow Pit

Borrow pits shall be continuously protected against the ingress of surface water and the Contractor shall construct such temporary banks as may be required to divert surface water and as far as possible his operations shall be planned in such a way that the borrow pit is self-draining. Where this is not possible, borrow pits shall be dewatered by pumping. The Contractor shall be solely responsible for keeping borrow areas dry and ensuring that borrow material is sufficiently dry when required for use.

Add the following Clause 612

612 REINSTATEMENT OF BORROW AREAS

On completion of his operations in a borrow area, the Contractor shall reinstate the entire area so as to blend with the surrounding area and to permit the re-establishment of vegetation. For this purpose, the borrow area shall be shaped to even contours. All material in and around the borrow area, whether spoil from road building operations, excess stock-piled material, oversized material left in the borrow pit, material resulting from clearing and grubbing operations and excess overburden, shall be used or disposed off as directed by the Engineer. Material not capable of supporting vegetation shall be buried and used in shaping the borrow area and subsequently covered with vegetable soil. All available soft material shall be spread evenly to the thickness directed and where sufficient material is not available for this purpose to cover the entire area, the remaining portions shall be scarified along the contours so as to avoid undue erosion.

All haul roads shall be obliterated and the surface scarified, earth banks constructed to prevent erosion and all damaged fences and other structures reinstated.

The shaping and reinstatement of the borrow pit shall be done in such a way that the borrow pit will be properly drained whenever practicable and where required, the Contractor shall place earth banks to divert any surface water away from the borrow area.

The reinstatement of any borrow pit shall be to the entire satisfaction of the Engineer, and the Contractor shall submit to the Engineer a signed certificate from the landowner stating that he is fully satisfied with the reinstatement of any borrow area.

SECTION 7 - EXCAVATION AND FILLING FOR STRUCTURES

703 EXCAVATION OF FOUNDATIONS FOR STRUCTURES

Unless otherwise instructed by the Engineer, all excavated surfaces in material other than hard material, on which foundations for structures shall be placed, shall be compacted to 100% MDD (AASHTO T.99) immediately before structures are constructed.

Paragraph 4, last line: - Replace "95%" with "100%".

707 BACKFILLING FOR STRUCTURES

Unless otherwise instructed by the Engineer, all backfilling material shall be compacted to a minimum of 100% MDD (AASHTO T.99).

709 EXCAVATIONS FOR RIVER TRAINING AND NEW WATER COURSES

Payments for river training and establishment of new watercourses shall only be made where such work constitute permanent works. Works done for road deviation or other temporary works shall not qualify for payment.

710 STONE PITCHING

Stone pitching to drains, inlets and outlets of culverts to embankments and around structure shall consist of sound unweathered rock approved by the Engineer. The stone as dressed shall be roughly cubical in shape with minimum dimensions of 150 x 150mm for normal thickness of stone pitching. Cement mortar Grouting will be done for all stone pitching areas and the top line of the stone pitching should be grouted/sealed with concrete class 15/20. The cement shall be mixed with sand in the ratio of 1:3 by volume to form the grout.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone laid, interlocked and rammed into the material to give an even finished surface. Soil erosion is rampant along the project location and this can be minimised by ensuring that proper protection works is carried out along the drains using stone pitching. Most of the sections shall be stone pitched especially areas where we have steep slopes to minimise undermining of the road by rain water or as may be instructed by the Engineer.

In areas where stone pitching has been damaged, the Contractor shall identify such areas and notify the Engineer for his agreement of the extent of the Works required and his approval and instructions to proceed with the Works. Stone Pitching Repair and reconstruction shall be carried out in accordance with Clause 710 of the Standard Specifications.

711 GABIONS

Where instructed by the Engineer the Contractor will install gabions as protection works to washout areas or bridge Piers and or Abutments. Gabions shall be constructed in accordance with Clause 711 of the Standard Specification.

In cases where existing gabions have been damaged, the Contractor shall identify them and notify the Engineer for his agreement of the extent of the Work required and his approval and instructions to proceed with the Works.

The Works shall involve removal of the damaged gabions / rocks, excavation to the correct levels and grades as directed by the Engineer, and in accordance with Clause 711 of the Standard Specifications and reconstruction with new gabions and other necessary materials as necessary. The damaged gabions shall be recovered and transported to the nearest KeNHA's Regional Manager's offices or as directed by the Engineer.

712 RIP-RAP

Add the following at the end:

Quarry waste or similar approved material shall be used to backfill scoured and eroded side, outfall and cut-off drains. The material shall be compacted to form a flat or curved surface preparatory to stone pitching of drainage channels, existing and new scour checks as directed by the Engineer.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone hand laid, interlocked and rammed into the material to give an even finished surface. The interstices of the pitching shall be rammed with insitu material. The in-situ material immediately behind the pitching shall be compacted to minimum density of 100% MDD compaction (AASHTO T99).

713 MEASUREMENT AND PAYMENT

Add the following to Sub-Clause 713(k):

No distinction shall be made in payment for the angle at which gabions are constructed

No separate payment shall be made for gravel for blinding or hauling to spoil unsuitable excavation material and the cost of such shall be included in rates and prices.

714 BACKFILL BELOW STRUCTURES

Add the following:

Where instructed this shall be carried out in compliance with the requirements of Clause 507 and 804 of the Standard Specification.

715 FILTER FABRIC

Where filter fabric is specified, it shall be durable non-woven geotextiles or synthetic fibres, unaffected by soil acidity, soil alkalinity and bacteria. The fabric shall be made by an approved, reputable manufacturer and shall have a mass and strength at least equal to 280g/m²

The mesh size of the fabric shall be sufficient to effectively retain the material on which it is placed but shall not be greater than 150 microns. The fabric shall be installed in accordance with the manufacturer's instructions. The fabric shall be placed on levelled ground, with sharp rocks and other objects which are likely to damage the fabric being removed and all pits and depressions being backfilled and compacted.

The fabric shall be overlapped by a minimum of 300 mm and stitched at joints in such a manner that the strength of the joints is at least 50 per cent of the strength of the fabric.

Rip-rap or gabions or other materials, as applicable, shall be placed carefully on the filter fabric in such a way as to avoid damage to the fabric. In any event construction procedures shall ensure no damage to the filter fabric or impairment of its design function. Should the filter fabric be damaged, it shall be replaced, including removal of the overlay material, in a manner approved by the Engineer.

No mechanical plant shall traffic over filter fabric unless a minimum thickness of 200 mm of fill material has been placed over the fabric.

SECTION 8 - CULVERTS AND DRAINAGE WORKS

All concrete works for culverts and other drainage structures shall be done in accordance with section 17 of the specifications.

804 EXCAVATION FOR CULVERTS AND DRAINAGE WORKS

In the Standard Specifications, make the following amendments: -

In paragraph 6, line 3, and in paragraph 7, line 5 and in paragraph 11, line 6, delete "95%" and insert "100%".

Removal of Existing Pipe Culverts

Where instructed by the Engineer, the Contractor shall excavate and remove all existing blocked or collapsed culvert pipes of 450mm, 600mm and 900mm diameter including concrete surround, bedding, inlet and outlet structures.

The void left after removal of culvert pipes shall be widened as necessary to accommodate new concrete bedding, pipe and haunching.

The payment of this work shall be per linear metre of pipes removed. The void left by removal of these pipes shall be carefully preserved in order to accommodate replacement 600mm or 900mm diameter pipe culverts as shall be directed by the Engineer.

Removal of Other Existing Drainage Structures

When instructed by the Engineer, the Contractor shall demolish or remove any other structure and payment for this shall be made on day work basis.

Excavation for Culverts and Drainage Works

The Contractor shall carry out all excavations for new culverts and drainage works to the lines, levels, inclinations, and dimensions shown on the drawings or as instructed by the Engineer.

805 EXCAVATION IN HARD MATERIAL

In the Standard Specifications, Sub-clauses 805(a) and 805 (b) delete "95%" and insert "100%".

In sub-clause 809(a), paragraph 1, line 1, substitute "95%" with "100%".

In sub-clause 809(c), paragraph 2, line 4, between the words "compacted" and "and shaped" insert the words "to 100% MDD (AASHTO T.99)".

Hard material is material that can be excavated only after blasting with explosives or boring and wedging or the use of a mechanical breaker fitted with a rock point in good condition and operated correctly. Boulders of more than 0.2m³ occurring in soft material shall be classified as hard material.

809 BEDDING AND LAYING OF PIPE CULVERTS

Concrete pipes shall be laid on a 150mm thick concrete bed of class 15/20 and the pipes shall be bedded on 1:3 cement: sand mortar at least 50mm thick, 150mm wide and extending the full length of the barrel.

The rates inserted shall allow for compaction of the bottom of excavation to 100% MDD (AASHTO T.99).

In addition to the requirements of the Standard Specification, where inflatable balloon method of casting culverts in-situ is used, it is essential that thorough pre-construction trials are carried out and necessary adjustments made to ensure that:-

All concrete used for surround and bedding shall be Class 25/20.

The inner concrete barrel surface immediately in contact with the inflated balloon form during placing shall achieve Class F3 finish.

The overall concrete thickness shall be the total of the standard precast concrete pipe thickness and the surround thickness as per the standard drawings.

Payments for the bedding, pipe culvert and surround shall be made as specified in the standard specifications. No additional payments shall be made for complying with these requirements where the balloon method is adopted.

810 JOINTING CONCRETE PIPES

The concrete pipes for the culverts shall have ogee joints and will be jointed by 1:2, cement: sand mortar and provided with fillets on the outside as described in clause 810 of the Standard Specification.

812 BACKFILLING OVER PIPE CULVERTS

In the Standard Specifications, clause 812

Delete paragraph 6 “for pipe culverts depth of 150mm”, entirely.

Wherever the expression "dry density of 95% MDD (AASHTO T. 99)" occurs delete and replace with "dry density of 100% MDD (AASHTO T.99)".

The rates entered for laying of pipe culverts shall allow for backfilling to pipe culverts and compacting to 100% MDD (AASHTO T.99) and these works shall not be measured and paid for separately.

814.1 SUBSOIL DRAINS

In the event of excavation for repairs exposing local seepage, springs or unacceptably high water table, the Engineer may instruct the provision of counter fort or French drains.

These drains shall consist of a trench excavated to the alignment, width, depth and gradient instructed by the Engineer, and backfilled with approved compacted clean hard crushed rock material as specified in clause 815 of the standard specification. Where these drains lie within the carriageway the carriageway shall be constructed only after the subsoil drain has been completed and approved by the Engineer

SECTION 9 - PASSAGE OF TRAFFIC

901 SCOPE OF THE SECTION

Add the following Sub-Clauses

901.1 PROGRAMME FOR PASSAGE OF TRAFFIC

Following the award of the Contract, the Contractor shall submit to the Engineer a detailed Programme for Passing of Traffic. Such programme shall be approved by the Engineer before the Contractor commences work, and shall show amongst other things the method of protection of the public and give details of the hours of operation, location types and numbers of traffic safety devices, barricades, warning signs, flagmen and the like. The Programme for Passing of Traffic shall be in accordance with and complementary to the Programme of Works submitted under Article 17 of the Condition of Contract.

In the preparation of this programme of Passage of Traffic, the Contractor should take into consideration the following: -

The Contractor shall conduct his operation in such a manner that no greater length or amount of work is undertaken than he can carry out efficiently having due regard to the rights and convenience of the public.

If the Contractor proposes a road closure he shall provide an alternative routing of the traffic which must be approved by the Engineer.

No revisions shall be made to the approved Programme for Passing of Traffic without the prior written permission of the Engineer, and the Contractor shall allow 6 days for the Engineer to review any request for a revision of the Programme for Passage of Traffic.

The Programme for Passage of Traffic shall conform in all aspects with the requirements of this Special Specification.

Temporary road signs, lights, marks, barriers, etc. for construction shall be in accordance with the laws of Kenya and shall include approved warning, mandatory, prohibitory and priority signs to the satisfaction of the Engineer, including, but not be limited to, signs giving warning

of construction works, reduction in speed, overtaking prohibited, road narrows, etc. Under no circumstances will work be allowed on the carriageway or shoulders of the road without such signs in both directions.

901.2 PASSAGE AND CONTROL OF TRAFFIC

It is an intention of the Contract that public traffic should be able to pass along the road to be rehabilitated / upgraded at all times during construction, within the road reserve of 18-25 m and in all weather. For this purpose, the Contractor will be required to order this work, etc, in such a way as to assure that a single lane at least 3.5 m wide is available for public traffic at all times and he shall furnish sufficient police assistance, watchmen, temporary traffic lights, road signs and barriers, competent flagmen and the like to control and regulate the flow of traffic under one-way traffic operations.

Sections of road where possible to carry traffic in two directions but with single lane width shall be regulated by temporary electric traffic lights and shall not be longer than 800 m. The Engineer may in exceptional circumstances allow longer sections where in his opinion this is unavoidable.

Where such sections are not more than about 100 m. in length and have a clear line of sight from one end to the other, the Engineer may allow manual traffic regulation by flagmen, rather than traffic lights, during daylight hours only. When electric traffic lights are in operation, the Contractor shall at all times have available complete reserve equipment and spare parts.

The frequency and duration of delays to traffic while passing through, over or across the Works, shall be kept to a minimum. They shall, in no case exceed half an hour and should normally be less than 20 minutes. Any method of working which requires road closures in excess of 30 minutes shall be the subject of 48 hours prior notice to and agreement of the Engineer, who may refuse to allow such closure.

The Contractor shall take particular care, when passing traffic through his Works, that all excavations and other hazards are properly protected with barriers and are illuminated at night.

The Contractor is placed on notice that maintenance of existing as well as diversion roads and protection of traffic through the Works during construction is considered as important as the construction itself. The Contractor shall all times, conduct his operations in a manner to ensure the convenience and safety of motorist, pedestrians, adjoining property owners and the safety on his own employees and those of the Engineer.

904 CONSTRUCTION OF DEVIATIONS

(a) General

Where in the opinion of the Contractor it is preferable not to pass traffic through the Works, the Contractor may, upon previous approval of the Engineer, be allowed to construct and maintain deviations provided that such deviations are passable to traffic at all times.

The length of the deviations shall be of the shortest practical length having regard to gradient and obstruction and shall be sited as agreed between the Engineer and the Contractor.

b) Geometry

The carriageway width of the deviations shall not be less than 7.0m wide and suitable for 2-way lorry traffic unless otherwise specified.

c) Construction

Unless otherwise instructed gravel wearing course for the deviation shall be 150 mm compacted thicknesses complying with section 10 of the Standard Specification. The Contractor shall allow in his rate for removal of any unsuitable material before placing of gravel wearing course, as this will not be paid for separately.

In addition to provision of this clause, Contractor is required to sprinkle water at least 4 times a day at the rate of 1 - 1.4 litres/m² in regular interval to minimise the effects of dust. Latest sprinkling time shall be one hour before the sunset.

Where a road is deviated to cross a large watercourse which is impracticable to bridge or culvert, a drift shall be constructed of stones or small boulders with the intersections filled with spalls to make a firm bottom. This pitching shall be carried up the banks of the watercourse above the flood level of the stream. The dimension of the drift shall be such that there is less than 0.20 m of water over the road at all times, except in flood. The edge of the drift shall be defined with posts or other markers and a gauge installed to indicate the maximum depth of water over the road. The minimum width of the drift shall be 3.5 m.

907 SIGNS, BARRIERS AND LIGHTS

Add the following to Clause 907:

The Contractor shall be responsible for the provision, erection, maintenance and removal of all temporary signs and barriers necessary for safety and convenience, to pass traffic not only upon the existing road to be repaired, but also on all minor and private roads off the site of the Works which are used as deviations.

Temporary "Advance Detour Signs" shall be erected before any road junction and a "Detour Sign" shall be erected at the junction of the deviation route and other minor roads where there is any possibility of the diverted traffic mistaking the route of the detour, and there shall be mounted on the same posts, a sign bearing the inscription "Detour".

In addition, any hazard such as a narrow bridge, drift, level crossing, steep hill, sharp bend, etc. occurring on the deviation shall be marked by the Contractor with the appropriate sign, if the existing sign is inadequate or none exists. All sharp bends and all places where the shoulder is higher than 2.0 m above the natural ground shall be marked with painted posts.

909 ASSISTANCE TO PUBLIC

Add the following:

The Contractor shall be responsible for safety maintaining and directing traffic through or around any part of the Works included in the Contract, with the maximum practical convenience, for the full twenty four hours of each day.

The Contractor shall render to the public all possible assistance when they are passing over roads maintained by him and over minor, private or temporary roads or bridges when used as deviation or when passing through the Works.

Whenever the Contractor's operations create a condition hazardous to traffic or to the public, he shall furnish, erect and maintain such fences, barricades, lights, signs and other services, as are necessary to prevent accidents or damage or injury to the public.

The Contractor shall also furnish such guards and flagmen as are necessary to give adequate warning to traffic or to the public of any dangerous conditions that might be encountered and shall provide prompt assistance to any vehicle experiencing difficulty in passing over the Works under construction, or through any diversions or roads maintained by the Contractor, if necessary by providing a towing vehicle, labour and tow rope to assist such vehicles.'

Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures, as above provided, the Engineer may direct attention to the existence of hazard, and the necessary warning and protective measures shall be furnished and installed at the Contractor's expense. Should the Engineer point out the inadequacy of warning and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or relieve him of his obligation to furnish and pay for these devices.

911 CONTRACTOR'S CONSTRUCTION TRAFFIC

Add the following new Clause 911.1 and 911.2.

911.1 Insurance

The Contractor's attention is particularly drawn to Clause 18, "Insurance" of the Conditions of Contracts, and the Contractor shall indemnify the Employer against and shall insure against all losses and claims for injuries or damage to any person or any property which may occur due to the passing of traffic, whether through the Works, or on specially constructed deviations, or on existing public or private roads used as deviations.

911.2 Penalty for failure to comply with these specifications

If, in any month, the Engineer is not satisfied that the Contractor has fully complied with any provisions or instructions under Section 9 of the Specifications, the Employer shall withhold the whole of the installment or payment due to the Contractor for the relevant item of work stated in the Bills of Quantities. Failure or refusal by the Contractor to maintain deviations, improve and maintain the existing roads ahead of the works, or failure to take the necessary actions for the safety and convenience of the public traffic within the time instructed or as required by Statutory Authorities shall be sufficient cause for the Employer to apply a deduction of Kshs.150,000/=(One Hundred and Fifty Thousand shillings) per day from any monies due to the Contractor, until all provisions and instructions prescribed have been complied with to the satisfaction of the Engineer. Provided further that where notified by the Engineer and the Contractor fails to complete improvement or maintenance of any section of existing road or deviation within 14 days of the Engineer's notice thereof, the Employer shall deduct **Kshs 400,000/=** (Four hundred thousand shillings) per day.

912 MEASUREMENT AND PAYMENT

Insert the following immediately below the heading of this Clause in the Standard Specification:

The Contractor shall be deemed to have allowed elsewhere in his rates and prices for any differences between the actual cost of carrying out the works and the Lump Sum amounts for the said works priced by the contractor in the Bills of Quantities.

Delete paragraph 912 (a) and insert the following:

Item: Improve Existing Road

Unit: Lump Sum

Payment shall be by Lump Sum amount allowed in the Bills of Quantities. On satisfactory completion improvement of the whole road, 60% for the Lump Sum amount shall be paid to the contractor and the balance of 40% shall be paid in equal monthly installments throughout the remaining period of the contract excluding defects liability period and subject to any recoveries and deductions due under this Clause. The total sum of installments paid shall not exceed the Lump Sum amount.

Construct and maintain deviations

Unit: km

Construct and maintain Deviation shall be measured to the nearest 0.1 km along the centreline of the deviation road and paid for from the relevant item in the Bills of Quantities. The Contractor shall be paid 70% of the billed amount when he completes construction of the deviation road to the satisfaction of the Engineer. The balance shall be paid in equal monthly installments during the remaining period of the contract, excluding the period of defects liability, provided that the contractor has satisfactorily maintained the deviation in accordance with Clauses 904 and 905 of the Specification when the deviation road is in operation.

Payments for this item shall be subject to recoveries and deductions that become due under this Clause as a result of any failure by the contractor to carry out maintenance of the deviation road as required.

If the Contractor fails to construct and / or to maintain diversions at the proper time, or to take the necessary precautions for the safety and convenience of public traffic as required by statutory authorities or as ordered by the Engineer, the Employer may engage other contractors or use the services of others to maintain the diversion. The actual cost of such maintenance shall be deducted from the Contractor's interim payment certificate.

It is the Contractor's responsibility to plan and execute the construction of any diversions deemed necessary during construction work. Prior approval of the diversion routes must be

cleared with the landowners concerned and the Engineer before commencing the construction of any diversion.

(d) Item: Maintain the passage of traffic

Unit: Lump Sum

Payment shall be by Lump Sum amount allowed in the Bills of Quantities made in equal monthly installments for satisfactory and continuous maintenance and attendance to passage of traffic throughout the remaining period of the contract, excluding defects liability period and provided that:

The total sum of installments paid shall not exceed the Lump Sum amount.

Payments for this item shall **be subject to recoveries and deductions** that become due under this Clause as a result of failure by the contractor to maintain passage of traffic as required.

On completion of the Works, the Contractor shall remove all temporary diversions, haul roads, access ramps and signs and barriers, etc. and restore the land to its original condition.

SECTION 11 – SHOULDERS TO PAVEMENT

1101 GENERAL

Shoulders shall be constructed as per the drawings and in accordance with sections 12, 14, 15 and 16 of the specifications as appropriate.

SECTION 12 - NATURAL MATERIALS FOR SUB-BASE AND BASE

1203 MATERIAL REQUIREMENTS

Natural materials for base and subbase shall conform to the specifications given in Section 12 of the Standard Specifications for cement or lime improved base and subbase.

1209 MEASUREMENT AND PAYMENT

Natural material for subbase and base shall be measured by the cubic metre placed and compacted upon the road calculated as the product of the compacted sectional area laid and the length.

The method of measurement shall be “method - A” as in the standard specifications.

No extra payment will be made for haulage of gravel material as the overhaul costs shall be deemed to have been factored in the rates inserted in the Bills of Quantities.

SECTION 13–GRADED CRUSHED STONE FOR SUB-BASE AND BASE

1301 DEFINITIONS

Graded Crushed Stone 0/30, class A shall be used.

1303 MATERIAL REQUIREMENTS

b) In clarification to the provisions of this Clause, graded crushed stone material shall comply with the following requirements:

L.A.A	30max
A.C.V	25max
S.S.S	12max
F.I	25max
CR	100min

c) Stone should be free of foreign matter. The fines/passing 0.425mm sieve shall be non plastic

In clarification to-the provisions of this Clause the material shall be 0/30 mm and it's grading after compaction shall be a smooth curve within and approximately parallel to the following envelope:

Sieve size mm	Percentage by weight passing
50	-
37.5	100
28	90-100
20	65-95
10	40-70
6.3	30-55
2.0	20-40
1.0	15-32
0.425	10-24
0.075	4-10

1303 LAYING AND COMPACTING GRADED CRUSHED STONE SUBBASE AND BASE

In clarification to the provisions of this Clause, Graded Crushed Stone shall be laid by a mechanical paver and shall be improved a maximum of 2% cement as instructed by the Engineer.

SECTION 14 - CEMENT AND LIME TREATED MATERIALS

1405 MATERIAL REQUIREMENTS

a) Cement

Cement for improvement shall be ORDINARY PORTLAND CEMENT (OPC) complying with KS 1725: 2001 CEM I 42.5 N.

b) Lime

Sub-clause 1403 (b) part (ii) of the Standard Specification applies.

1409 PROTECTION AND CURING

Curing of treated material shall be by method (i) or method (iii). Method (ii) is prohibited.

SECTION 15 - BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING

PART A - GENERAL

1501A BITUMINOUS SURFACE TREATMENT

Quality control, workmanship and equipment shall be to current international best practice. Bituminous surface treatments shall be carefully designed by the Contractor, taking into account traffic volumes, ALD of the chippings, surface conditions and requirements for specific locations.

Application rates of the bitumen spray and the chippings will be approved by the Engineer prior to any trial sections of the work, but the under listed is anticipated and can be used for guidance purpose:

a) Chippings

14/20mm size pre-coated chippings at a spread rate of 60-100m²/m³

10/14mm size pre-coated chippings at a spread rate of 70-90m²/m³

6/10mm size pre-coated chippings at a spread rate of 70-120m²/m³

b) Bitumen Spray Rates

1.0 - 1.4 l/m² for the first seal or single seal to main carriageway

0.8 - 1.0 l/m² for the second seal to main carriageway

1504A HEATING OF BITUMINOUS BINDER

Bitumen 80/100 shall be sprayed in the range of 140°C - 200°C and the maximum heating temperature is 180°C. Bituminous binder shall not be kept within spraying temperature range for periods exceeding 1 hour.

1505A ADHESION AGENT

For all surface dressing, an approved adhesion agent shall be added to the binder, unless otherwise instructed by the Engineer. Adhesion agent shall be added to, and well mixed with, the binder immediately before each spray run.

1506A CONSTRUCTION LIMITATIONS

No bituminous spray shall be applied to a surface with a road temperature of less than 25°C for surface dressing, and 15°C for prime coat, or with adverse weather conditions threatening. A minimum period of 6 weeks shall elapse between the placement of asphalt and the application thereon of bituminous surface dressing.

PART B - PRIME COAT AND TACK COAT

1502B MATERIALS FOR PRIME COAT AND TACK COAT

For Prime coat, the binder shall be a medium-curing cut-back MC 30 unless otherwise directed by the Engineer. The binder for prime coat shall applied over the full width of the surface of the course to receive the first layer of bituminous material.

The binder for the tack coat shall be K1-70. A tack coat shall be applied over the full width of the surface of each bituminous material to receive a further bituminous layer. A tack coat shall also be applied to any prime coat, which has lost its adhesive properties due to contamination or long exposure or weathering before receiving the bituminous layer. Such an application shall be made without additional expense to the Employer unless it is required due to reasons outside the Contractor's control.

Blinding material shall be crusher dust, or a clean fine aggregate or coarse sand free from lumps of clay or other deleterious matter.

1504B SPRAYING OF PRIME COAT AND TACK COAT

Application rates of the bituminous prime coat shall be designed by the Contractor to take into account surface condition of the surface to be primed, expected traffic conditions, blinding, and the time duration before the subsequent bituminous treatment is applied

The rate of spray of bituminous prime coat refers to the gross volume of the cut-back bitumen, that is to say the volume of the bitumen plus dilutant.

The rate of application of prime coat shall be between 0.8 and 1.2 litres/m². The exact quantity to be applied may be varied within these limits to suit field conditions and will be determined from trials by the Engineer.

The rate of application of the tack coat on bituminous surfaces shall be between 0.3 and 0.8 litres/m². The exact quantity to be applied may be varied within these limits to suit field conditions and will be determined from trials by the Contractor and approved by the Engineer.

1506B TOLERANCES

Tolerance shall be +5% of the rate ordered. Work records are to be kept on a daily basis, with details recorded and calculated at the end of each distributor run. The Contractor shall prepare and use a suitable record sheet, which records details of weather and road temperature conditions, length and width of each run, binder dipping before and after each run of the distributor, calculation of actual application rate, under or overspray, and spray outside tolerance. Actual application rates shall be calculated immediately after each run, so that the operation of the distributor can be adjusted to ensure subsequent application rates are within tolerance.

PART C - SURFACE DRESSING

1502C MATERIALS FOR SURFACE DRESSING

The Contractor shall take full responsibility for the design and construction of all surface dressings. They shall, however, be constructed using the materials specified below. The proposed designs and construction procedures shall be presented to the Engineer for approval prior to the commencement of any surface dressing work on any section of the road.

a) Binder

The bituminous binder shall be a straight-run 80/100 penetration grade bitumen, with adhesion agent added to the binder at the rate of 0.5 – 1.0% by volume as approved by the Engineer, and conforming to Clause 211 of the Standard Specification. Binder cut-back with kerosene fuel in accordance with prevailing road temperature shall only be used if instructed by the Engineer.

b) Chippings

Chippings shall be of Class 1 materials and shall comply in all respects with clause 1502C of the Standard Specification. Should it prove necessary in the Engineer's opinion to wash chippings, no extra payment will be made to the Contractor for this operation.

1503C SPRAY AND SPREAD RATES OF BITUMEN AND CHIPPINGS

Spray and Spread Rates for bitumen and chippings cannot be calculated until samples of the chippings to be used are available for test. The tests shall be carried out and the rates shall be determined in accordance with the design method described in TRL ORN3 and approved by the Engineer.

After submission of samples and completion of laboratory tests on chippings and binder, and design of the surface dressing by the Contractor, the Contractor shall in the presence of the Engineer, lay trial sections of seal at various rates of spray and spread as approved by the Engineer and in accordance with Clause 1503C of the Standard Specification.

Should any change occur in nature of source of chippings or bitumen, the Contractor shall advise the Engineer accordingly who will then decide if any revisions are required to the spray and spread rates. If any changes are required, the Contractor shall carry out further trials as instructed by the Engineer.

The Engineer will approve the spray rates of bitumen as residual bitumen per square meter adjusted to 15.6°C. Actual spray rates used by the Contractor must be adjusted to compensate for any cut-back added.

1505C PRECOATED CHIPPINGS

Where shown on the drawings or instructed by the Engineer, chippings used for surface dressing shall be precoated. The bituminous binder used for precoating shall be anionic A3 bitumen emulsion.

The chippings shall be completely coated with the binder at a rate of about 0.4 to 1.0% by dry weight of chippings. The actual rate of application shall be as instructed by the Engineer following Contractor's field trials.

Mixing plant shall comply with the requirements of Clause 1603A, sub-clause (a) and (b) of the Specification.

The binder shall be heated so that it can be distributed uniformly and care shall be taken not to overheat it. The temperature shall at no time exceed 35°C.

The chippings shall be washed (if necessary), dried and heated so that they are mixed at a temperature of between 20°C and 35°C. The binder shall be introduced in the mixer in the amount specified and the materials mixed until a complete and uniform coating of the chippings is obtained.

Should any change occur in the nature of source of chippings or binder, the Contractor shall advise the Engineer accordingly who will then decide if new field trials are necessary and if any revisions are required to the spray and spread rates.

1506C CONSTRUCTION PLANT FOR SURFACE DRESSING

Bitumen Distributor

The bitumen distributor shall have a calibrated dipstick able to accurately measure the contents of the distributor to the nearest 50 litres.

1508C APPLICATION OF SURFACE DRESSING

When commencing and stopping spraying, sheets of clean building paper at least 2m wide shall be spread across the full width to be sprayed to give a good sharp edge. Care shall to be taken at longitudinal joints to use appropriate end nozzles to ensure prevention of overlapping of bitumen spray.

1509C AFTERCARE AND CONTROL OF TRAFFIC

Surface dressing shall not be trafficked for at least seven days. Where the surface dressing is to be applied to a new Asphaltic concrete, a period of minimum 28 days must elapse before commencing the surface dressing

1510C TOLERANCES

Tolerance shall be +5% of the rate ordered. Work records are to be kept on a daily basis, with details recorded and calculated at the end of each distributor run The Contractor shall prepare and use a suitable record sheet, which records details of weather and road temperature conditions, length and width of run, binder dippings before and after each run of the distributor, calculation of actual application rate, under or overspray, and spray outside tolerance, chipping details and actual spread rate. Actual application

rates shall be calculated immediately after each run, so that the operation of the distributor or aggregate spreader can be adjusted to ensure subsequent application rates are within tolerance.

1511C PAYMENT FOR SURFACE DRESSING

a) Item: Seal Coat

Unit: Litre (of medium cut bitumen used for each seal coat).

b) Item: Tack Coat

Unit: Litre of diluted emulsion.

c) Item: Precoated Chippings Unit: m of each nominal size for each class

Precoated chippings shall be measured by the cubic metre of each nominal size for each class calculated as the product of the area in square metres instructed to be covered and the reciprocal of the instructed rate of application in square metres/cubic metre or the actual rate of application in square metres/ cubic metre whichever gives the lower volume.

The unit rate for pre-coated chippings shall include the cost of providing and hauling the chippings and bitumen, precoating the chippings at instructed rates, spreading and rolling the chippings at application rate falling within the specified range and complying with Parts A and C of Section 15 of this Specification.

The rate inserted for blending 80/100 penetration grade bitumen with kerosene shall be for the amount of cutter in litres used for cut-back.

The rate inserted for providing and adding adhesion agent to the bitumen binder shall be for the amount of adhesion agent in litres used.

SECTION 16 - BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES

This section covers different types of bituminous mixes for base and surface (wearing and binder courses) and is divided into the following parts:-

Part A General

Part B Superpave Performance Grade Bitumen- Asphalt Concrete for Surfacing

Part C Superpave Performance Grade Bitumen -Dense Bitumen Macadam for Base

PART A - GENERAL

1601A SCOPE

Part A comprises all the general requirements for bituminous mixes which apply to Part B and C as well. Quality control, workmanship and equipment shall be to current international best practice.

1602A REQUIREMENTS FROM OTHER SECTIONS

The following sections of this Specification apply to Part B of this section and shall be read in conjunction therewith:-

Section 2 Materials and Testing of Materials

Section 3 Setting Out and Tolerances

Section 6 Quarries, Borrow Pits, Stockpile and Spoil Areas

Section 15 Bituminous Surface Treatments and Surface Dressing

1603A CONSTRUCTION PLANT

c) Laying Plant

The self-propelled spreader finisher shall be fitted with electronic level control devices, and level control shall be from tensioned wire supported at every 5m intervals or leveling beam, as tried on site and subsequently approved by the Engineer.

d) Compaction Plant

The Contractor shall provide sufficient rollers of adequate size and weight to achieve the specified compaction. Prior to commencing the laying of bituminous mixes in the permanent works, the Contractor shall carry out site trials in accordance with Section 2 of this Specification to demonstrate the adequacy of his plant and to determine the optimum method of use and sequence of operation of the rollers.

It is important to achieve as high a density as possible at the time of construction and it is expected that vibrating rollers will be required to produce the best results. However, it is essential that thorough pre-construction trials are carried out to ensure that:

The roller is set up to have the optimum amplitude and frequency of vibration for the particular material being laid.

That the roller does not cause breakdown of the aggregate particles.

That the optimum compaction temperatures are established which allow compaction without causing ripple effects or other distortions of the surfacing.

1605A DESIGN AND WORKING MIXES

The Contractor shall design a job-mix formula and carry out all appropriate laboratory tests and site trials to produce a working mix, which conforms in all respects to the requirements of this Specification, and is approved for use by the Engineer two months prior to commencing work using a bituminous mix,. The mixes are to be designed in accordance with ORN19: A guide to the design of hot mix asphalt in tropical and sub-tropical countries.

A volumetric design shall be carried out using the Marshall Method as described in Appendix C of ORN19. The mixes must also satisfy the refusal density requirements. This test is to be carried out in accordance with Appendix G of ORN19. The voids in mix (VIM) must be $>3\%$ at refusal density at the optimum bitumen content from the Marshall design and also at the optimum plus and optimum minus the margin of tolerance permitted during mixing (bitumen content as percent of total mix $+ 0.3\%$).

Natural sand shall not be used in bituminous mixes.

1606A SITE TRIALS

Replace the second paragraph with the following:

The trials shall be carried out to:

Test materials, designed in the laboratory, so that a workable mix which satisfies the specification requirements can be selected.

To enable the Contractor to demonstrate the suitability of his mixing and compaction equipment to provide and compact the material to the specified density and to confirm that the other specified requirements of the completed asphalt pavement layer can be achieved.

1607A MIXING OF AGGREGATES AND BITUMEN

The aggregates, minus the filler, prepared as specified above, shall be accurately weighed and conveyed into the mixer in proportionate amounts of each aggregate size required to meet the Job-Mix Formula.

The required amount of bitumen for each batch shall be introduced into the mixer. In batch mixing, the bitumen shall be added after the aggregates have been introduced into the mixer and mixed for 5 to 10 seconds. The filler shall be added after the bitumen and mixing shall continue after addition of the filler for at least the time recommended by the plant manufacturer, or as much extra time as is necessary to obtain a homogeneous mixture, but for no longer.

Aggregate and bitumen shall each be heated to enter the mixing chamber at temperatures selected within the range 150oC to 170oC. The temperature of the stone at entry to the mixing chamber shall not be more than 15oC higher than that of the bitumen: the temperature of the bitumen shall be such that on entry to the mixer its kinematic viscosity is in the range 150 - 300 centistokes. The temperature of the aggregate and bitumen at entry into the mixing chamber shall be chosen within the above limits and having regard to the prevailing air temperature and haulage distance to ensure that the temperature of the mix is between 135oC and 165oC when it is laid and not less than 120oC when rolling is commenced. If excessive displacement occurs under the roller the minimum rolling temperature may be reduced at the sole discretion of the Engineer.

The volume of the aggregate and bitumen shall not be so great as to extend above the tips of the mixer blades when the blades are in vertical position. All overheated and carbonized mixtures, which foam or show indication of moisture, will be rejected. When moisture is detected in the finished mixture, all aggregates in the bins shall be removed and returned to the stockpiles.

1608A TRANSPORTING THE MIXTURE

Add the following:

The mix shall be transported from the mixing plant to the spreader in trucks having tight, clean, smooth beds, which have been treated to prevent adhesion of the mixture to the truck bodies. Gasoline, kerosene, diesel fuel or other solvents shall not be used for this purpose. Loads shall be covered by waterproof canvas or metal sheets during wet weather. Vehicles shall be insulated when the air temperature and/or length of haul make this necessary to maintain the temperature between the specified limits. Any loads wetted excessively by rain will be rejected. Hauling over freshly laid material will not be permitted.

1609A LAYING THE MIXTURE

The speed of the spreader shall be adjusted to match the speed of mix supply to ensure a continuous paving operation giving a smooth surface. Paving lanes shall be parallel to the road centreline, and true to line and level.

Where possible laying plant capable of spreading the mixture over the required full paved width shall be used, which may require the use of at least two mechanical pavers working in echelon.

All joints shall present the same texture, density and smoothness as other areas of the surfacing. The joints between old and new lanes or sections shall be carefully formed in such manner as to ensure a continuous bond between the old and new pavement. All contact surfaces at cold joints, joints with manholes, pits, etc. shall be coated with a thin, uniform coat of MC70 or other medium curing bitumen or as directed by the engineer

1610A COMPACTION

Replace the 4th paragraph by the following:

Initial rolling with a pneumatic tyred roller shall follow the laying plant as closely as possible. The rollers shall be operated at a slow and uniform speed (not exceeding 5km/h).

Add the following at the end:

Tests for conformity with the smoothness and levels specified shall be made by the Contractor immediately after initial compaction and any deviations in excess of the specified tolerances shall be corrected by loosening the hot surface with rakes and removing or adding material as necessary before continuing the rolling. The speed of the rollers shall not exceed 5km/h and shall at all times be slow enough to avoid displacement of the hot mixture. Any displacement of the mixture occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once by loosening the surface with rakes and re-rolling. Rolling of the surfacing shall be continued until all roller marks are eliminated and the required density is obtained.

The rollers shall not be permitted to stand on surfacing which has not been fully compacted. Precautions shall be taken to prevent the dropping of oil, grease, gasoline, or other foreign matter on any layer. The Contractor shall provide competent workmen who are capable of performing all work incidentals to the correction of all surfacing irregularities.

After final rolling, no vehicular traffic of any kind shall be permitted for at least 12 hours

1611A FINISHING, JOINTS AND EDGES

Amend the second paragraph as follows:

Spreading of the mixture shall be as continuous as possible. Transverse joints shall be formed by cutting neatly in a straight line across the previous run to expose the full depth of the course. The vertical face so formed shall be painted lightly with hot 50/70 penetration grade bitumen just before the additional mixture is placed against it.

Amend the fourth paragraph as follows:

When the abutting lane is not placed in the same day, or the joint is destroyed by traffic, the edge of the lane shall be cut back as necessary, trimmed to line and painted lightly with 'hot 50/70 penetration grade bitumen just before the abutting lane is placed.

Any fresh mixture spread accidentally on the existing work at a joint shall be carefully removed by brooming it back on to uncompacted work, so as to avoid formation of irregularities at the joint. The finish at joints shall comply with the surface requirements and shall present the same uniformity of finish, texture and density as other sections of the work. The edges of the course shall be rolled concurrently with or immediately after the longitudinal joint. In rolling the edges, roller wheels shall extend 50 to 100mm beyond the edge.

Add the following:

The Contractor shall produce a plan showing the position of all pavement construction joints for approval by the Engineer before pavement construction commences.

Construction joints in the various pavement layers shall be staggered by at least the following distances: Transverse joints in binder course shall be staggered by at least 500mm. The roller shall pass over the unprotected end of the freshly laid mixture only when laying of the surfacing is to be discontinued for such length of time as to permit the mixture to become cold. Otherwise 500mm at the end of the lane shall be left uncompacted.

Cold transverse joints shall be cut back to expose an even, vertical surface for the full compacted thickness of the course and painted with medium curing cutback bitumen as specified above. The fresh mixture shall be raked uniformly against the joint, and carefully compacted to ensure a good bond with the cold material.

The Contractor shall adjust any kerbs, gulley pots and chambers in accordance with final finished road level before laying the final Asphalt Concrete binder material 0/14 and 0/20 surfacing layer.

PART B - SUPERPAVE PERFORMANCE GRADE BITUMEN- ASPHALT CONCRETE FOR SURFACING

1601B INTRODUCTION

Some modifications, to the Standard Specification, which takes into account some aspects of the Superpave-Performance Grade Bitumen Mixture Design methods, have been made. This shall be in accordance with the procedures presented in Overseas Road Note 19, A guide to the design of hot mix asphalt in tropical and subtropical countries’’ and detailed in the current manuals produced by the Asphalt Institute. The contractor shall be deemed to possess a copy of these publications and shall provide at least two copies of each on site, one for the Engineer and the other for the Contractor.

1602B MATERIALS FOR SUPERPAVE PERFORMANCE GRADE- BITUMEN ASPHALT CONCRETE

(a) Performance grade bitumen

Delete sub-section (a) and replace with:

The bitumen shall be performance grade, and shall meet the requirements of Table NA.1 in EN 12591:2009(E) as summarized below:

Property	Test Method	Unit	Pen 40/60	Pen 50/70	Pen 70/100
Based on original bitumen penetration at 25°C	EN1426	0.1mm	40-60	50-70	70-100
Softening point (°C)	EN 1427		48-56	46-54	43-51
Resistance to hardening after heating for 5 hr at 163°C	EN 12607-1				
a) Retained penetration		%	> 50	> 50	> 46
b) Increase in softening point, Severity 1		°C	< 9	< 9	< 9
c) Change of mass ^a (absolute value)		%	< 0.5	< 0.5	< 0.8
Flash point	EN ISO 2592	°C	> 230	> 230	> 230
Solubility	EN 12592	%	> 99.0	> 99.0	> 99.0
Kinematic viscosity at 135°C	EN 12595	mm ^{24 25} /s	> 325	> 295	> 230
^a Change in mass can be either positive or negative.					

The bitumen for asphalt concrete works shall be 50/70 penetration grade

b) Aggregate

²⁴ AASHTO T176

²⁵ British Standard 1377: Part 2

In the Standard Specifications rename Table 16B-1 as 16B-1(a)

Add the following:

The coarse aggregate shall be entirely crushed rock from a source which is known to give high values of stability (>9kN) in the Marshall test. Crushed river gravel shall not be used. Aggregates shall meet the requirements of given in Table 16B-1(b) below.

Table 16 B-1(b) Requirements of Aggregate

Property	Test	Parameter
Cleanliness	Sand equivalent for 4.75mm fraction ¹	> 40
	Plasticity index for materials passing 0.425mm sieve ²	<4
	Linear shrinkage for materials passing 0.425mm sieve, %	<2
Particle shape	Flakiness Index (FI) ²⁶	<25
Strength	Aggregate Crushing Value, (ACV) ²⁷	< 25
	Aggregate Impact Value, (AIV) ⁴	<25
	10% FACT (dry) kN ⁴	> 160
	Los Angeles Abrasion, (LAA) ²⁸	<30
Abrasion	Aggregate Abrasion Value ⁴	< 14
Soundness ²⁹ 5cycles % loss	Sodium Sulphate Soundness (SSS) Coarse aggregate	<10
	Sodium Sulphate Soundness (SSS) Fine aggregate	<16
	Magnesium Sulphate Soundness (MSS) Coarse aggregate	<15
	Magnesium Sulphate Soundness (MSS) Fine aggregate	<20
Polishing	Polished Stone Value	>57
Water absorption	Water absorption, % ³⁰	<2
Bitumen affinity	Immersion Mechanical Test: Index of retained Marshall stability, % ³¹	>75
	Static Immersion Test, % coating retained ³²	>95
	Retained Indirect Tensile Strength % at 7% VIM ^{33 34}	>79

Unless otherwise instructed by the Engineer aggregates should satisfy the following Superpave Performance Grade Bitumen aggregate consensus properties which requirements are presented in Table 16B-1(c):

Coarse Aggregate Angularity (CAA) - ASTM D 5821

Fine Aggregate Angularity (FAA) - AASHTO T 304

Flat and elongated particles - ASTM D 4791

Sand equivalent - AASHTO T 176

26 British Standard 812: Part 105
 27 British Standard 812: Part 110 to 114
 28 ASTM C131 and C 535
 29 AASHTO T104
 30 British Standard 812: Part 2
 31 D Whiteoak (1990)
 32 AASHTO T 182
 33 AASHTO T 283
 34 BS EN 12591: 2009

Table 16B-1(c) Superpave Performance Grade Bitumen aggregate consensus property requirements:

Cumulative Equivalent Standard Axles (CESA)' Million	Fractured faces, Coarse Aggregate, Percent Minimum		Uncompacted Void Content of Fine Aggregate, Percent Minimum		Sand Equivalent, Percent Minimum	Flat and Elongated, Percent Maximum
	Depth from surface		Depth from surface			
	<100mm	>100mm	<100mm	>100mm		
3 to <10	85/802	60/-	45	40	45	10
10 to <30	95/90	80/75	45	40	45	10

1603B GRADING REQUIREMENTS

The grading mixture of coarse and fine aggregate shall meet the requirements given in Table 16B-1(d) and Table 16B-1(e) for a 19mm and 12.5mm nominal maximum size aggregate.

Table 16B-1(d) Superpave Performance Grade Bitumen aggregate grading control point

Nominal Maximum Size (mm) (Note 1 below)	Sieve size (mm)	Control point (%passing)	
		Minimum	Maximum
19.0	25	100	-
	19	90	100
	12.5	-	90
	2.36	23	49
	0.075	2	8
12.5	19	100	-
	12.5	90	100
	9.5	-	90
	2.36	28	58
	0.075	2	10

Table 16B-1(e) Superpave Performance Grade Bitumen boundaries of aggregate restricted zone (Note 2 below)

Sieve size within restricted zone (mm)	Percent passing sieve size Nominal maximum size (mm) (Note 1 below)			
	19.0		12.5	
	Minimum	Maximum	Minimum	Maximum
2.36	34.6	34.6	39.1	39.1
1.18	22.3	28.3	25.6	31.6
0.6	16.7	20.7	19.1	23.1
0.3	13.7	13.7	15.5	15.5

Note (1) - The definition of Nominal Maximum Size of aggregate is one sieve larger than the first sieve to retain more than ten per cent of the aggregate. It is also recommended that where possible the largest

particle size should not be more than 25 mm so that the requirements of the Marshall test can be complied with.

Note (2) - If gradations that violate the restricted zone perform similarly to or better than the mixes having gradations passing outside the restricted zone; then, the restricted zone requirement is redundant for mixes meeting all Marshall and/or Superpave Performance Grade Bitumen volumetric parameters specified in section 1604B of this specification.

1604B REQUIREMENTS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN ASPHALT CONCRETE

The mix design should be carried out using the Marshall and/or the Superpave Performance Grade Bitumen test procedures. The Engineer should instruct in writing if either or both of these methods should be applied.

The mix design specifications for the two methods are as follows:

Marshall Method

The mixture shall comply with the requirements given in Table 16B-2(a).

TABLE 16B-2(a) Requirements for Asphalt Concrete

Asphalt concrete	No. of blows Marshall compaction	Minimum Stability (kN)	Flow (mm)	Air voids (VIM) (%)	Voids in Mineral Aggregate (VMA) (%)
19	75 ¹	9	2 - 4	3 - 6	Minimum 13
12.5	75 ¹	9	2 - 4	3 - 6	Minimum 14

Note 1: Satisfactory volumetric composition must be confirmed by refusal density testing

The nominal binder content shall be 5%. In addition to the requirements given in Table 16B-2, the maximum Marshall Stability for 2x75 blows shall be 18 KN, and at compaction to refusal shall retain a minimum of 3% VIM.

In order to determine the suitability of a coarse aggregate source, a Marshall Test programme shall be carried out. It will be advantageous to use a crushed rock which is known from past experience to give good results in this test procedure and should meet the requirements presented in Table 16B-1(b) and Table 16B-1(c). A grading conforming to requirements detailed in Table 16B-1(d) and Table 16B- 1(e) of this Specification shall be used.

Having established the suitability of the aggregate source, several gradings satisfying the requirements of Table 16B-1(d) and Table 16B-1(e) shall be tested in the laboratory, including that used for the Marshall test, to establish relationships between bitumen content and VIM at refusal density. For each

mix, samples will be made up to a range of bitumen contents and compacted to refusal using a vibratory hammer in accordance with BS 598 (Part 104:1989) with the following revision:

“It should first be confirmed that compaction on one face of the sample gives the same refusal density as when the compaction cycle is applied to both faces of the same sample. The procedure which gives the highest result shall be used.”

From the bitumen content-VIM relationship a bitumen content which corresponds to VIM of 3% shall be identified. Compaction trials shall be undertaken, to confirm the workability of the mix. At least two or more gradings will be required for compaction trials. The compaction trials will identify a workable mix which can be made to a bitumen content which gives 3% Voids in Mix (VIM) at refusal density.

Superpave Performance Grade Bitumen Method

The mix design, when compacted in accordance with AASHTO T 312 (Preparing and determining the density of Hot Mix Asphalt (HMA) specimens by means of the Superpave Performance Grade Bitumen gyratory compactor) shall meet the relative density, voids in the mineral aggregate (VMA), Voids filled with Asphalt (VFA) and dust to binder ratio requirements specified in Table 16-B2(b).

The initial, design and maximum number of gyrations are specified in AASHTO R 35, Superpave Performance Grade Bitumen volumetric design for Hot Mix Asphalt (HMA).

Table 16-B2(b) Requirements for Asphalt Concrete

Cumulative Equivalent Standard Axles (CESA)' in Million	Required Relative Density, Percent of theoretical maximum specific gravity			Voids in the Mineral Aggregate (VMA), Percent Minimum		Voids Filled with Asphalt (VFA) Range, Percent	Dust-to- Binder Ratio Range
	N initial	N design	N max	Nominal maximum size Aggregate (mm)			
				19.0	12.5		
3 to <10	>89.0	96.0	>98.0	13.0	14.0	65-75	0.6-1.2
10 to <30	>89.0	96.0	>98.0	13.0	14.0	65-75	0.6-1.2

1605B MIXING AND LAYING HEAVY DUTY ASPHALT

Amend with the following:

The temperature of the bitumen and aggregates when mixed should be determined using both Penetration Index (PI) and softening point of the bitumen on the bitumen tests data chart (BTDC). The temperature of the bitumen and aggregates when mixed shall be 110+/-30C above the softening point (Ring and Ball) of the bitumen.

Compaction shall commence as soon as the mix can support the roller without undue displacement of material and completed before the temperature of the mix falls below 90°C.

The mixing and placing of asphalt concrete must be carried out only under favourable weather conditions. Mixing and placing of asphalt concrete will not be allowed if the moisture content of aggregate affects the uniformity of temperature, or if free water is present on the working surface. Mixing shall not be allowed to take place more than two hours before placing begins unless provision had been made for storing. Storage of mixed materials will only be permitted in insulated hot mix bins. In any case, storage will not be permitted for a period longer than 12 hours after mixing, unless otherwise approved by the Engineer.

The minimum thickness of the compacted layer shall be 35mm when 12.5mm nominal maximum size aggregate is used (on the road shoulders).

1606B COMPACTION

Rolling shall be continued until compaction of the completed layer attains a minimum mean value of 95% of refusal density (no value less than 93%) and until the voids measured in the compacted layer are within the specified range as appropriate.

PART C - SUPERPAVE PERFORMANCE GRADE BITUMEN - DENSE BITUMEN MACADAM FOR BASE

1602C MATERIALS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN DENSE BITUMEN MACADAM

(a) Superpave Performance Grade Bitumen

Bitumen for Dense bitumen Macadam shall be 50/70 penetration grade and shall meet the requirements stated in 1602B of this specification.

(b) Aggregate

Coarse aggregate (retained on a 6.3mm sieve) shall consist of crushed stone free from clay, silt, organic matter and other deleterious substances and shall comply with the following requirements

The crushing ratio shall not be less than 100%

1603C GRADING REQUIREMENTS

The grading mixture of coarse and fine aggregate shall be within and approximately parallel to the grading envelopes as given in Table 16C-1b

Table 16C-1(a) Superpave aggregate grading control point

Nominal Maximum Size (mm) (Note 1 below)	Sieve size (mm)	Control point (%passing)	
		Minimum	Maximum
37.5	50	100	-
	37.5	90	100
	25	-	90
	2.36	15	41
	0.075	0	6

Table 16C-1(b) Superpave Performance Grade Bitumen boundaries of aggregate restricted zone

Sieve size within restricted zone (mm)	Percent passing sieve size Nominal maximum size (mm) (Note 1 below)	
	Minimum	Maximum
4.75	34.7	34.7
2.36	23.3	27.3
1.18	15.5	21.5
0.6	11.7	15.7
0.3	10	10

Note (1) - The definition of Nominal Maximum Size of aggregate is one sieve larger than the first sieve to retain more than ten per cent of the aggregate

Note (2) - If gradations that violate the restricted zone perform similarly to or better than the mixes having gradations passing outside the restricted zone; then, the restricted zone requirement is redundant for mixes meeting all Marshall and/or Superpave Performance Grade Bitumen volumetric parameters specified in section 1604C of this specification.

1604C REQUIREMENTS FOR SUPERPAVE PERFORMANCE GRADE BITUMEN - DENSE BITUMEN MACADAM BASE COURSE

No formal design method is available for determining the optimum composition for this material because the maximum particle size and proportions of aggregate greater than 25mm precludes the use of the Marshall test. However, the Superpave Performance Grade Bitumen method can be carried out and is proposed for determining its optimum composition.

The mixture shall comply with the requirements given in Table 16C-2.

Table 16C-2 Requirements for Bitumen Macadam Base Course

Cumulative Equivalent Standard Axles (CESA) ¹ in Million	Required Relative Density, Percent of theoretical maximum specific gravity			Voids in the Mineral Aggregate (VMA), Percent Minimum	Voids Filled with Asphalt (VFA) Range, Percent	Dust-to- Binder Ratio Range
	N initial	N design	N max	Nominal maximum size Aggregate (mm)		
>10	>89.0	96.0	>98.0	11.0	64-75	0.6-1.2

The proportion, by mass of total mix, of bitumen (binder content) shall be 4.0+/-0.5. The binder content of the working mix will be instructed by the Engineer following laboratory and site trials

1605C MIXING AND LAYING OF SUPERPAVE PERFORMANCE GRADE BITUMEN -DENSE BITUMEN MACADAM BASE COURSE

The mixing temperature of the Superpave Performance Grade Bitumen Macadam Base Course shall be between 1400C and 1700C. Where possible, the viscosity of the bitumen should be measured over a range of temperatures and plotted on the Bitumen Test Data Chart so that the ideal mixing temperature, at which the viscosity of the bitumen is between approximately 0.2 and 0.5 Pa's, can then be read from the chart. The minimum temperature at laying and commencement of compaction shall be 1200C and at completion of compaction shall be not less than 900C

Laying plant capable of spreading the mixture over the full carriageway width shall be preferred, otherwise two mechanical pavers working in echelon shall be used and the longitudinal joint shall be compacted before the temperature of the existing lane has dropped to 700C

The minimum thickness of the compacted layer shall be 75mm and no compacted layer shall exceed 125mm

1606C COMPACTION

Rolling shall be continued until compaction of the completed layer attains a minimum mean value of 95% of refusal density (no value less than 93%) and until the voids measured in the compacted layer are within the specified range as appropriate.

SECTION 17 - CONCRETE WORKS

1703 MATERIALS FOR CONCRETE

Cement shall comply with the following Kenyan Standards:

- KS1725: 2001 CEM 1 42.5 N for ordinary Portland cement

1703, 1704, 1705 CONCRETE WORKS

LEVELLING CONCRETE (CLASS 15/20) FOR BOTTOM SLAB INCLUSIVE OF COST OF FORMWORKS

This work shall consist of placing and levelling lean Concrete Class 15/20 over the prepared bed of stone boulders in the foundation for bottom slab and wingwalls in accordance with these specifications and which conformity with the lines, grades, thickness and typical cross-sections shown on the drawings unless otherwise directed by the Engineer.

a) Materials for Levelling Concrete

Requirement for the concrete Class 15/20 is specified as follows: -

Design compressive strength twenty-eight (28) days	: 15N/mm ²
Maximum size of coarse aggregate	: 20mm
Minimum cement content	: 300 kg/m ³ .
Maximum water/cement ration of 50% with slump of 80mm.	

b) Construction Method

The bed of stone boulders or formation upon which the levelling concrete will be placed shall be free from water, smooth, compacted and true to the grades and cross-section shall be set to the required lines and grades.

c) Measurement and payment

Measurement for levelling concrete (Class 15/20) shall be made in cubic metres completed and accepted levelling concrete work measured in place which is done in accordance with the Drawings and the Specifications.

Payment for this work shall be the full compensation for furnishing and placing all materials, labour, equipment and tools, and other incidentals to Specifications and as directed by the Engineer.

(CLASS 25/20) OF CULVERT WALLS AND SLABS

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of culvert walls and slabs, in accordance with these Specifications and in conformity with the requirements shown on the Drawings.

Concrete Class 25/20 shall be used for Culvert walls and slabs.

a) Concrete Materials

i) Cement

Cement shall be of Portland type and shall conform to the requirements of BS 12 or equivalent.

The Contractor shall select only one type or brand of cement or others. Changing of type or brand of cement will not be permitted without a new mix design approved by the Engineer. All cement is subject to the Engineer's approval; however, approval of cement by the Engineer shall not relieve the Contractor of the responsibility to furnish concrete of the specified compressive strength.

Conveyance of cement by jute bags shall not be permitted. Storage in the Contractor's silo or storehouse shall not exceed more than two (2) months, and age of cement after manufacture at mill shall not exceed more than four (4) months. The Contractor shall submit to the Engineer for his approval the result of quality certificate done prepared by the manufacturer.

Whenever it is found out that cement have been stored too long, moist, or caked, the cement shall be rejected and removed from the project.

b) Aggregates

Fine and coarse aggregates must be clean, hard, strong and durable, not susceptible to ASR and free from absorbed chemicals, clay coating, or materials in amounts that could affect hydration, bonding, strength and durability of concrete.

Grading of aggregates shall conform to the following requirements:

Grading of Fine Aggregates

Sieve Size (mm)	Percentage by Weight Passing
10	100
5	89 -100
2.5	60 -100
1.2	30 -100
0.6	15 - 54
0.3	5 - 40
0.15	0 - 15

Grading of Coarse Aggregates

Size of Coarse Aggregate	Amounts finer than each standard sieve percentage by weight							
	40	30	25	20	15	10	5	2.5
% by weight	100	-	-	90-100	-	30-69	0-10	-

Other requirements for aggregates are as follows:

iii) Fine Aggregates

Fitness Modulus, AASHTO M-6 : 2.3 – 3.1
Sodium Sulphate Soundness, AASHTO T104 : Max. 10% loss
Content of Friable Particles AASHTO 112 : Max 1% by weight
Sand Equivalent, AASHTO T176 : Min. 75

iv) Coarse Aggregate

Abrasion, AASGTO T96 : Max. 405 loss
Soft Fragment and shale, AASHTO M80 : Max. 5% by weight
Thin and elongated Pieces, AASHTO M80 : Max. 15%

v) Water

All sources of water to be used with cement shall be approved by the Engineer. Water shall be free from injurious quantities of oil, alkali, vegetation matter and salt as determined by the Engineer.

vi) Admixture

Only admixture, which have been tested and approved in the site laboratory through trial mixing for design proportion shall be used.

Before selection of admixture, the Contractor shall submit to the Engineer the specific information or guarantees prepared by the admixture supplier. The Contractor shall not exclude the admixture from concrete proportions.

Chemical admixtures where permitted shall conform to the requirements of AASHTO M194. Unless otherwise specified, only Type A (water reducing), Type B (retarding), Type D (water reducing and retarding), Type F (water reducing, high range) or Type G (water reducing, high range and retarding) shall be used.

Admixtures containing Chloride Ion (Cl) in excess of one percent by weight of the admixture shall not be used in reinforced concrete.

A Certificate of Compliance signed by the manufacturer of the admixture shall be furnished to the Engineer for each shipment of the material used in the works.

c) Concrete Class 25/20

The requirements of Concrete Class 25/20 are provided as follows unless otherwise the Engineer will designate any alteration.

Design compressive strength (28) days : 25N/mm²

Minimum cement content : 300kg/m³

Maximum cement content : 540kg/m³

Maximum size of coarse aggregates : 20mm

Maximum water/cement ratio of 50% with slump of 80mm

d) Proportioning Concrete

The Contractor shall consult with the Engineer as to mix proportions at least thirty (30) days prior to beginning the concrete work. The actual mix proportions of cement, aggregates, water and admixture shall be determined by the Contractor under supervision of the Engineer in the site laboratory.

The Contractor shall prepare the design proportions which has 120% of the strength requirement specified for the designated class of concrete.

No class of concrete shall be prepared or placed until its job-mix proportions have been approved by the Engineer.

Concrete Works

Batching

Batching shall be done by weight with accuracy of:

Cement : ½ percent

Aggregate : ½ percent

Water and Admixture : 1 percent.

Equipment should be capable of measuring quantities within these tolerances for the smartest batch regularly used, as well as for larger batches.

The accuracy of batching equipment should be checked every month in the presence of the Engineer and adjusted when necessary.

Mixing and delivery

Slump of mixed concrete shall be checked and approved at an accuracy of +25mm against designated slump in these Specifications.

Concrete in hot weather

No concrete shall be placed when the ambient air temperature is expected to exceed 33°C during placement operations.

Concreting at night

No concrete shall be mixed, placed or finished when natural light is insufficient, unless an adequate approved artificial lighting system is operated; such night work is subject to approval by the engineer.

Placing

In preparation of the placing of concrete, the interior space of forms shall be cleaned and approved by the engineer prior to placing concrete. All temporary members except tie bars to support forms shall be removed entirely from the forms and not buried in the concrete. The use of open and vertical chute shall not be permitted unless otherwise directed by the engineer.

The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

Measurement and Payment

Measurements for the Concrete Works Class 25/20 of culvert walls and slabs, shall be made in cubic metres for the walls and slabs actually constructed, measured from their dimensions shown on the Drawings. Payment for the Concrete Works (Class 25/20) of culvert walls and slabs shall be the full compensation for furnishing all materials of the concrete mixing, delivering, placing, finishing horizontal surfaces to class UF2 finish, and curing the concrete, equipment and tools, labour and other incidental necessary for the completion of the work in accordance with the Drawings and these Specifications and as directed by the Engineer.

(CLASS 30/20) –

Description

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of the insitu beams, deck slab and columns, in accordance with Standard Specifications and in conformity with the requirements shown on the Drawings.

Concrete Materials

Cement

a)

Cement shall be of Portland type and shall conform to the requirements of BS or equivalent.

b) The Contractor shall select only one type or brand of cement or others. Changing of type or of cement will not be permitted without a new mix design approved by the Engineer. All cement is subject to the Engineers approval however, approval of cement by the Engineer shall not relieve the Contractor of the responsibility to furnish concrete of the specified compressive strength.

c) Conveyance of cement by jute bags shall not be permitted. Storage in the Contractors silo or store house shall not exceed more than two (2) months, and age of cement after submit to the Engineer for his approval the result of quality certificate done prepared by the manufacturer.

d) Whenever it is found out that cement have been stored too long, moist, or caked, the cement shall be rejected and removed from the project.

Aggregates

e)

Fine and coarse aggregates must be clean, hard, strong and durable, not susceptible to ASR and free from absorbed chemicals, clay coating, or materials in amounts that could affect hydration, bonding, strength and durability of concrete. The aggregates should conform to BS 882.

f) Grading of aggregates shall conform to BS 812.

Other requirements for aggregates are as follows:

Fine Aggregates

Fitness Modulus, AASHTO M-6	: 2.3 - 3.1
Sodium Sulphate Soundness, AASHTO T104	: Max. 10% loss
Content of Friable Particles AASHTO 112	: Max. 1% by weight
Sand Equivalent, AASHTO T176	: Min. 75

Coarse Aggregate

Abrasion, AASHTO T96	: Max. 405loss
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Soft Fragment and shale, AASHTO M80	: Max. 5% by weight
Thin and elongated pieces, AASHTO M80	: Max. 15%

Water

All sources of water to be used with cement shall be approved by the Engineer. Water shall be free from injurious quantities of oil, alkali, vegetation and salt as determined by the Engineer.

Admixture

Only admixture, which have been tested and approved in the site laboratory through trial mixing for design proportion shall be used.

Before selection of admixture, the Contractor shall submit to the Engineer the specific information or guarantees prepared by the admixture supplier.

The Contractor shall not exclude the admixture from concrete proportions.

Concrete Class 30/20

Concrete Class 30/20 shall be used for beams, deck slab and columns. The requirements of Concrete Class 30/20 are provided as follows unless otherwise the Engineer will designate any alteration:

Design compressive strength (28) days	: 30N/mm ²
Maximum size of coarse aggregates	: 20mm
Minimum cement content	: 340kg/m ³
Maximum cement content	: 540kg/m ³
Maximum water/cement ratio of 45% with slump of 80mm	

Proportioning Concrete

The Contractor shall consult with the Engineer as to mix proportions at least thirty (30) days prior to beginning the concrete work. The actual mix proportions of cement, aggregates, water and admixture shall be determined by the Contractor under supervision of the Engineer in the site laboratory.

The Contractor shall prepare the design proportions which has 120% of the strength requirement specified for the designated class of concrete.

No Class of Concrete shall be prepared or placed until its job-mix proportions have been approved by the Engineer.

Concreting Work

a) Batching

Batching shall be done by weight with accuracy of;

Cement : $\frac{1}{2}$ percent

Aggregate : $\frac{1}{2}$ percent

Water and Admixture : 1 percent

Equipment should be capable of measuring quantities within these tolerances for the smallest batch regularly used, as well as for larger batches.

The accuracy of batching equipment should be checked every month in the presence of the Engineer and adjusted when necessary.

b) Mixing and Delivery

Slump of mixed concrete shall be checked and approved against designated slump in these specifications. The time elapsing from when the water is added to the mix until the concrete is deposited in place at the site of the work shall not exceed thirty (30) minutes in case that the concrete is hauled in non agitative type trucks or carries, nor more than sixty (60) minutes in case that it is hauled in truck mixers or other carriers with agitators.

c) Concrete in Hot Weather

No concrete shall be placed when the ambient air temperature is expected to exceed 33°C during placement operations.

d) Concreting at Night

No concrete shall be mixed, placed or finished when natural light is insufficient, unless an adequate approved artificial lighting system is operated, and such night work is subject to approval by the Engineer.

e) Placing

In preparation of the placing of concrete, the interior space of forms shall be cleaned and approved by the Engineer prior to placing concrete. All temporary members except tie bars to support forms shall be removed entirely from the forms and not buried in the concrete. The use of open and vertical chute shall not be permitted unless otherwise directed by the Engineer. The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

f) Measurement and Payment

Measurements for the Concrete Works Class 30/20 of beams, deck slab and columns shall be made in cubic metres for the walls and slabs actually constructed, measured from their dimensions shown on the Drawings.

Payment for the Concrete Works (Class 30/20) of beams, deck slab and columns shall be the full compensation for furnishing all materials of the concrete mixing, delivering, placing, finishing horizontal surfaces to class UF2 finish, and curing the concrete, equipment and tools, labour and other incidentals necessary for the completion of the work in accordance with the Drawings and these Specifications and as directed by the Engineer.

(CLASS 40/20) FOR BRIDGEWORKS

Design compressive strength twenty-eight (28) days : 40N/mm²

Maximum size of coarse aggregates : 20mm

1722 FORMWORK FOR CULVERT WALLS AND SLABS

This work shall consist of all temporary moulds for forming the concrete for culvert walls and slabs together with all temporary construction required for their support. Unless otherwise directed by the Engineer all formworks shall be removed on completion of the walls and slabs.

a) Materials

Forms shall be made of wood or metal and shall conform to the shape, lines and dimensions shown on the Drawings.

All timber shall be free from holes, loose material, knots, cracks, splits and warps or other defects affecting the strength or appearance of the finished structure.

Release Agents – Release agents shall be either neat oils containing a surface activating agent, cream emulsions, or chemical agents to be approved by the Engineer.

b) Construction Method

i) Formworks

Formworks shall be designed to carry the maximum loads which may be imposed, and so be rigidly constructed as to prevent deformation due to load, drying and wetting, vibration and other causes. After forms have been set in correct location, they shall be inspected and approved by the Engineer before the concrete is placed.

If requested, the Contractor shall submit to the Engineer working drawings of the forms and also, if requested, calculations to certify the rigidity of the forms.

Unless otherwise described in the Contract, all form joints for exposed surfaces of concrete shall form a regular pattern with horizontal and vertical lines continuous throughout each structure and all construction joints shall coincide with these horizontal and vertical lines.

Form joints shall be sealed against leakage of mortar. PVC pipes of 50mm diameter for weep holes shall be arranged as shown on the Drawings.

Unless otherwise specified, formwork shall be designed to form chamfers at all external corners whether or not such chamfers are shown on the Drawings to prevent cracks and other damage from arising.

The inside surface of forms shall be cleaned and coated with a releasing agent to prevent adhesion of the concrete. Release agents shall be applied strictly in accordance with the manufacturer's detailed instructions. The release agent shall be applied to the formwork prior

to erection. Release agent must not come into contact with reinforcement. Immediately before concrete is placed, the forms shall thoroughly be thoroughly cleaned and freed from sawdust, shavings, dust, mud or other debris by hosing with water. Temporary openings shall be provided in the forms to drain away the water and rubbish.

ii) Scaffolding

All scaffolding required to support the forms shall be designed and constructed to provide necessary rigidity and support the loads without appreciable deflection or deformation.

Details, plans and structural and flexural calculations for scaffolding shall be submitted to the Engineer for approval, but in no case shall the Contractor be relieved of his responsibility for the results obtained by use of these plans, etc.

iii) Removal of formwork

The time at which the formwork is struck shall be the Contractor's responsibility and the forms shall not be removed until the concrete strength has reached 20N/mm^2 .

c) Measurement and Payment

Formwork shall be measured as the net area, in square metres, in contact with the finished concrete surface of the walls and slabs. No measurement shall be allowed for formwork of temporary construction joints.

Payment for the Formworks shall be full compensation for furnishing, erecting, jointing all the forms for the concrete including furnishing and applying release agent, and construction of the required scaffolding to support the forms, all conforming to the shape, lines, grade and dimensions of the structure as shown on the Drawings, all in accordance with the Drawings and as directed by the Engineer.

1728 REINFORCING BARS OF WALLS AND SLABS

This work shall consist of furnishing, fabricating and placing in the concrete of the bottom slab, top slab, beams, median wall, sidewalls, wingwalls and aprons, reinforcing bars of the quality, type and size in accordance with these Specifications and in conformity with the requirements shown on the Drawings.

Reinforcing bars shall be high yield deformed bar and shall meet the requirements of British Standard BS 4449, unless otherwise called for the drawings or approved by the Engineer.

No reinforcing bar shall be delivered without a Certificate guaranteeing the yield stress. Testing for compliance will be at the Contractor's expense

1729 STORAGE OF REINFORCEMENT

Reinforcement shall be kept off the ground, free from dirt, oil, grease and rust and stored within a building or provided with suitable covers.

1730 BENDING REINFORCEMENT

The Contractor shall prepare bar bending schedules for the approval of the Engineer showing the location types, sizes, bending dimensions and cut lengths of the reinforcing bar required to be fixed in the works.

Qualified men shall be employed for the cutting and bending, and proper application shall be provided for such work.

Bars shall be cut and bent cold to the dimensions indicated and with equipment and methods approved by the Engineer.

Stirrups and tie bars shall be bent around a pin having a diameter not less than 15 times the minimum diameter of the bar. Bends of other bars, where full tension in the bar may occur, shall be made around a pin having a diameter not less than 7.5 times the bar diameter as shown on the Drawings.

Reinforcing bars shall be accurately formed to the shapes and dimensions indicated on the Drawings, and shall be fabricated in a manner that will not injure the materials.

1731 FIXING REINFORCEMENT

Reinforcing bars shall be accurately placed in proper position, and so that they be firmly held during placing of concrete. Bars shall be tied at all intersections by using annealed iron wire 0.9mm or larger diameter, or suitable clips.

Distances from the forms shall be maintained, corrected by means of metal hangers, metal blocks, metal supports or other supports approved by the Engineer.

The Engineer shall inspect reinforcing bars after placing. When a long time has elapsed after placing reinforcing bars, they shall be cleaned and inspected again by the Engineer before placing concrete.

When it is necessary to splice reinforcing bars at points, position and methods of splicing shall be determined based on strength calculations and approved by the Engineer.

In lapped splices, the bars shall be lapped by the required length, and wired together at several points by using annealed iron wire larger than 0.9mm. The minimum splice length shall be 40 times diameter of the bar unless otherwise shown on the drawings or instructed by the Engineer.

Exposed reinforcing bars intended for bonding with future extensions shall be effectively protected from injury and corrosion.

Oxyacetylene welding joint of reinforcing steel shall be done only if authorized by the Engineer in writing.

1741 MEASUREMENT AND PAYMENT

Bending and installation of reinforcement bars shall be measured in terms of tons. In computing the weight to be measured, the theoretical weights of bars of the cross-section shown on the Drawings or authorized shall be used.

These weights are given in the following table: -

Bar type and Size	Weight (Kg/m)
Y8	0.395
Y10	0.617
Y12	0.888
Y16	1.58
Y20	2.47
Y25	3.85
R25	3.85
Y32	6.32

SECTION 17A - CONCRETE BLOCK PAVING

17A/01 GENERAL

This section includes:

Interlocking concrete paver units (manually installed)

Bedding and joint sand

Edge Restraints

17A/02 DELIVERY, STORAGE AND HANDLING

Delivery; Materials must be delivered materials in manufacturers original, unopened, undamaged containers packaging with identification labels intact. Concrete pavers are to be delivered to site in steel banded or plastic wrapped packaging capable of transfer by fork lift or clamp lift.

Storage and protection; Materials must be stored and protected such that they are kept free from mud, dirt and other foreign materials. Concrete paver cleaners and sealers are to be stored as per manufacturer's instructions.

17A/03 INTERLOCKING CONCRETE PAVERS

Precast concrete blocks shall comply with the requirements of BS EN 1338

Precast concrete paving blocks shall be chamfered and shall conform to BS EN 1338 and the shape, dimensions, tolerances, colors and performances and classes required are as described below.

Shape	Rectangular
Sizes	200mm x 100mm x 100mm
Colour	Grey
Pattern	Herringbone

Precast paving blocks shall be laid in accordance with BS 7533-3.

17A/04 EDGE RESTRAINTS

Edge restraints shall be provided around the complete area of blocks.

Temporary restraints must be provided to prevent paving units moving during construction or for areas that cannot be completed for some time.

Edge restraints may be formed by existing structures, kerbs, channels, edgings, blocks set on concrete, etc. Edge restraints shall be capable of preventing the loss of laying course sand and the sideways movement of blocks, and of supporting anticipated traffic loads.

17A/05 BEDDING AND JOINTING MATERIAL

The laying course material shall comply with the grading requirements specified below.

Sieve size (mm)	Percentage by mass passing (%)	
8	100	100
6.3	95	100
4	85	99
0.5	30	70
0.063	0	1.5

The jointing sand shall be clean, hard, non-plastic, and free from deleterious matter and silt, symmetrically shaped, natural or manufactured from crushed rock.

Stone dust, mason dust and limestone screenings shall not be used. The jointing material (sand) shall conform to the grading requirements as specified below.

Sieve size (mm)	Percentage by mass passing (%)
2	100
1	85 – 99
0.5	55 – 100
0.063 (fines content)	– 2

17A/06 SUB – LAYER FOR PAVEMENT

The contractor shall ensure that the sub-grade, sub – base and base materials and preparation shall comply with the requirements of the standard and special specifications.

The surface levels for each layer shall not deviate from the design levels specified and tolerances stated below (17A/08).

The finished base sub-layer shall have, immediately before overlaying, a close-textured surface, be free from compaction planes, ridges, cracks or loose material and show no movement under the compaction plant. The contractor shall proceed with the laying of bedding sand and interlocking concrete pavers only after the sub-grade, sub–base and base conditions are approved and accepted by the Resident Engineer/Supervisors Representative.

Any drainage provided within the sub-layer shall be completed in conjunction with the sub-layer construction before the laying course is placed. Drainage inlets shall be protected with filter fabrics to prevent ingress of laying course material.

17A/07 LAYING

Paving units

Concrete block paving units shall not be installed during heavy rain or on saturated sand.

Concrete block paving units shall be placed either mechanically or by hand, on the prepared laying course in the nominated pattern. String lines will be used to check alignment of paving blocks joint (bond) lines shall not deviate more than +/- 15mm in 15m. The order of laying which maintains an open face should be used. After final compaction the surface course must conform to the surface tolerance levels.

Cutting and Trimming

Cut blocks should only be incorporated at the perimeter of the pavement, at intermediate restraints and around obstacles. Sizes smaller than one quarter of the original plan size should be avoided. Blocks should be trimmed to fit after laying full paving blocks.

Joint filling

Prior to commencing the joint filling process all debris must be swept off the pavement surface and the following checked for compliance:

surface level tolerances	$\pm 6\text{mm}$
flatness of the pavement	10 mm under 3m straight edge
difference in levels between blocks	2mm
joint width	2mm to 5mm and consistent
joints are correctly aligned	+/- 15mm in 15m
there are no damaged or cracked blocks	

Necessary corrective action must be taken to ensure the pavement conforms to the specification.

Jointing material shall be brushed into the joints to completely fill the joints, followed by two or more applications of the vibrating plate compactor over the surface course. Additional jointing material shall be added to top up the joint as necessary after compaction.

No joints should be left unfilled and uncompacted at the completion of a day's work, except for areas less than 1 m from an unrestrained edge.

Compaction

A plate compactor with minimum plate area of 0.25SM capable of 75KN per unit area of plate at a frequency of 65 – 100 Hz shall be used to bed the blocks into the laying course by making at least two passes.

Prior to compaction all debris must be removed from the surface. Compaction should not occur within 2m of unrestrained edges of paving units.

17A/08 TOLERANCE OF SURFACE LEVEL AND SURFACE REGULARITY

The maximum permissible deviations from the design level of the different layers are

Sub – base	+5mm, -10mm
Road base	+5mm, -10mm

*Laying course (bedding sand)	40mm thickness, -5mm, +10mm
Surface course	± 6mm

The bedding sand must not be used as a leveling course to fill voids in the base surface as this will lead to subsequent settlement. Before commencement of the block laying, the preceding work i.e. base construction and edge restraints shall be checked to ensure they are in compliance with the tolerances stated above. Particular attention shall be paid to the base levels and tolerances to ensure that when the block layer is completed the sand laying course nowhere exceeds 50mm in thickness.

The absolute maximum thickness of bedding sand layer shall be 50mm. Where this thickness is exceeded the contractor will scarify, add material, shape and re-compact the base layer at his own expense to ensure compliance.

Where blocks are laid abutting drainage channels and outlets for pedestrian areas or fittings, the surface of the blocks shall be between 3mm and 6mm above the channel or fitting.

Where blocks are laid abutting gullies or drainage fittings, the surface of the blocks shall be between 5mm and 10mm above the gully grating and frame.

17A/09 MEASUREMENT AND PAYMENT

Item: Interlocking concrete block paving

Unit: m²

Interlocking block paving shall be measured by the square metre of the finished pavement area.

The rate shall include for provision of all materials, including precast concrete paving blocks, bedding sand, edge restraints, cutting & shaping of concrete blocks around the periphery of the pavement area, as necessary, to comply with the construction drawings.

The rate shall also include for compaction of bedding and all measures required to produce the finished paved areas within the tolerances specified.

SECTION 19 – STRUCTURAL STEELWORK

All structural steelworks shall be done in accordance with section 19 of the specifications.

SECTION 20 - ROAD FURNITURE

2001 ROAD RESERVE BOUNDARY POSTS

Road reserve boundary posts shall be provided, with reference points, in compliance with Standard Specification Clause 2001. They shall be placed at 100m intervals along the boundary of the road reserve.

2003 EDGE MARKER POSTS

Edge marker posts shall be provided as directed by the Engineer and in compliance with Standard Specification Clause 2003

2004 PERMANENT ROAD SIGNS

Permanent Road Signs shall be provided as directed by the Engineer and in compliance with the requirements of the "Manual for Traffic Signs in Kenya - Part II" and Standard Specification Clause 2004.

2005 ROAD MARKING

Paint for road marking shall be hot-applied thermoplastic paint and shall comply with BS 3262. The paint shall be surface reflectorised complying with BS 6088.

The Contractor shall forward all paint intended for application to Materials Department, Ministry of Roads (MOR) at least seven months before the date of the application for testing and approval.

General

The colour, width and layout of road markings shall be in accordance with the 'Manual for Traffic Signs in Kenya', Part 1, and standard Specification clause 2005 and as specified in the drawings or as directed by the Engineer.

Materials

Road markings shall be of hot applied thermoplastic compound as specified in the item and the material shall meet the requirements as specified below:

Hot Applied Thermoplastic Road Marking

General:

- (i) The work under this section consists of marking traffic stripes using a thermoplastic compound meeting the requirements specified herein.
- (ii) The thermoplastic compound shall be screeded/extruded on to the pavement surface in a molten state by suitable machine capable of controlled preparation and laying with surface application of glass beads at a specific rate. Upon cooling to ambient pavement temperature, it shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation by traffic,
- (iii) The colour of the compound shall be white or yellow (IS colour No. 556) as specified in the drawings or as directed by the Engineer.
- (iv) Where the compound is to be applied to cement concrete pavement, a sealing primer as recommended by the manufacturer, shall be applied to the pavement in advance of placing of the stripes to ensure proper bonding of the compound.

On new concrete surface any laitance and/or curing compound shall be removed before the markings are applied.

Thermoplastic Material

General: The thermoplastic material shall be homogeneously composed of aggregate, pigment, resins and glass reflectorizing beads.

Requirements:

Composition: The pigment, beads, and aggregate shall be uniformly dispersed in the resin. The material shall be free from all skins, dirt and foreign objects and shall comply with requirements indicated in Table 20-1.

Table 20-1. PROPORTIONS OF CONSTITUENTS OF MARKING MATERIAL

(Percentage by weight)

Component	White	Yellow
Binder	18.0 min.	18.0 min.
Glass Beads	30-40	30-40
Titanium Dioxide	10.0 min.	—
Calcium Carbonate and Inert Fillers	42.0 max.	See Note
Yellow Pigments	—	See Note

Note: Amount of yellow pigment, calcium carbonate and inert fillers shall be at the option of the manufacturer, provided all other requirements of this Specification are met

(i) Properties: The properties of thermoplastic material, when tested in accordance with ASTM D36/BS - 3 262 - (Part 1), shall be as below:

(a) Luminance:

White: Daylight luminance at 45 degrees-65 per cent min. as per AASHTO M 249

Yellow: Daylight luminance at 45 degrees -45 per cent min. as per AASHTO M 249

(b) Drying time: When applied at a temperature specified by the manufacturer and to the required thickness, the material shall set LO bear traffic in not more than 15 minutes.

(c) Skid resistance: not less than 45 as per BS 6044.

(d) Cracking resistance at low temperature: The material shall show i-o cracks on application to concrete blocks.

(e) Softening point: $102.5 \pm 9.5^{\circ}$ C as per ASTM D 36.

(f) How resistance: Not more than 2.5 per cent as per AASHTO M 249.

(g) Yellowness index (for white thermoplastic paint): not more than 0.12 as per AASHTO M 249

(iii) Storage life: The material shall meet the requirements of these Specifications for a period of one year. The thermoplastic material must also melt uniformly with no evidence of skins or unmelted panicles for the one-year storage period.

Any material not meeting the above requirements shall be replaced by the manufacturer/supplier/Contractor.

(iv) Reflectorisation: Shall be achieved by incorporation of beads, the grading and other properties of the beads shall be as specified in Clause 803.4.3.

(v) Marking: Each container of the thermoplastic material shall be clearly and indelibly marked with the following information:

1. The name, trade mark or other means of identification of manufacturer
2. Batch number
3. Date of manufacture
4. Colour (white or yellow)
5. Maximum application temperature and maximum safe heating temperature.

(vi) Sampling and testing: The thermoplastic material shall be sampled and tested in accordance with the appropriate ASTM/BS method. The Contractor shall furnish to the Employer a copy of certified test reports from the manufacturers of the thermoplastic material showing results of all tests specified herein and shall certify that the material meets all requirements of this Specification,

Reflectorising glass beads

General: This Specification covers two types of glass beads to be used for the production of reflectorised pavement markings.

Type 1 beads are those which are a constituent of the basic thermoplastic compound vide Table 20- 1 and Type 2 beads are those which are to be sprayed on the surface .

The glass beads shall be transparent, colourless and free from milkiness, dark particles and excessive air inclusions.

These shall conform to the requirements spelt out in here below:

Specific requirements

Gradation: The glass beads shall meet the gradation requirements for the two types as given in Table 20-2.

Table 20- 2. GRADATION REQUIREMENTS FOR GLASS BEADS

Sieve size	Per cent retained	
	Type 1	Type 2
1.18 mm	0 to 3	
850 micron	5 to 20	0 to 5
600 micron	-	5 to 20
425 micron	65 to 95	-
300 micron	-	30 to 75
ISO micron	0 to 10	10 to 30
below 180 micron	-	0 to 15

- B. Roundness: The glass beads shall have a minimum of 70 per cent true spheres.
- C. Refractive index: The glass beads shall have a minimum refractive index of 1.50.
- D. Free flowing properties: The glass beads shall be free of hard lumps and clusters and shall dispense readily under any conditions suitable for paint striping. They shall pass the free flow - test.

Test methods: The specific requirements shall be tested with the following methods:

- (i) Free- flow test -Spread 100 grams of beads evenly in a 100 mm diameter glass dish. Place the dish in a 250 mm inside diameter desiccator which is filled within 25 mm of the top of a desiccator plate with sulphuric acid water solution {specific gravity 1.10}. Cover the desiccator and let it stand for 4 hours at 20 to 29-degree C. Remove sample from desiccator, transfer beads to a pan and inspect for lumps or clusters. Then pour beads into a clean, dry glass funnel having a 100mm stem and 6 mm orifice. If necessary, initiate flow by lightly tapping the funnel. The glass spheres shall be essentially free of lumps and clusters and shall flow freely through the funnel.

- (ii) The requirements of gradation, roundness and refractive index of glass beads and the amount of glass beads in the compound shall be tested as per B3 6088 and BS 3262 (Part I).
- (iii) The Contractor shall furnish to the Employer a copy of certified test reports from the manufacturer of glass beads obtained from a reputed laboratory showing results of all tests specified herein and shall certify that the material meets all requirements of this Specification. However, if so required, these tests may be carried out as directed by the Engineer.

Application properties of thermoplastic material

The thermoplastic material shall readily get screeded/extruded at temperatures specified by the manufacturers for respective method of application to produce a line of specified thickness which shall be continuous and uniform in shape having clear and sharp edges.

The material upon heating to application temperatures shall not exude fumes, which are toxic, obnoxious or injurious to persons or property.

Preparation:

- (i) The material shall be melted in accordance with the manufacturer's instructions in a heater filled with a mechanical stirrer to give a smooth consistency to the thermoplastic material to avoid local overheating. The temperature of the mass shall be within the range specified by the manufacturer, and shall on no account be allowed to exceed the maximum temperature stated by the manufacturer. The molten material should be used as expeditiously as possible and for thermoplastic material which has natural binders or is otherwise sensitive to prolonged heating, the material shall not be maintained in a molten condition for more than 4 hours.
- (ii) After transfer to the laying equipment, the material shall be maintained within the temperature range specified by the manufacturer for achieving the desired consistency for laying.

Properties of finished road marking :

- (a) The stripe shall not be slippery when wet.
- (b) The marking shall not lift from the pavement in freezing weather.
- (c) After application and proper drying, the stripe shall show no appreciable deformation or discolouration under traffic and under road temperatures up to 60°C.
- (d) The marking shall not deteriorate by contact with sodium chloride, calcium chloride or oil drippings from traffic.
- (e) The stripe or marking shall maintain its original dimensions and position. Cold ductility of the material shall be such as to permit normal movement with the road surface without chopping or cracking.
- (f) The colour of yellow marking shall conform to IS Colour No. 356 as given in IS:164.

Application

Marking shall be done by machine. For locations where painting cannot be done by machine, approved manual methods shall be used with prior approval of the Engineer. The Contractor shall maintain control over traffic while painting operations are in progress so as to cause minimum inconvenience to traffic compatible with protecting the workmen.

The thermoplastic material shall be applied hot either by screeding or extrusion process. After transfer to the laying apparatus, the material shall be laid at a temperature within the range specified by the manufacturer for the particular method of laying being used. The paint shall be applied using a screed or extrusion machine.

The pavement temperature shall not be less than 10°C during application. All surfaces to be marked shall be thoroughly cleaned of all dust, dirt, grease, oil and all other foreign matter before application of the paint.

The material, when formed into traffic stripes, must be readily renewable by placing an overlay of new material directly over an old line of compatible material. Such new material shall so bond itself to the old line that no splitting or separation takes place. Thermoplastic paint shall be applied in intermittent or continuous lines of uniform thickness of at least 2.5 mm unless specified otherwise.

Where arrows or letters are to be provided, thermoplastic compound may be hand-sprayed. In addition to the beads included in the material, a further quantity of glass beads of Type 2, conforming to the above noted Specification shall be sprayed uniformly into a mono-layer on to the hot paint line in quick succession of the paint spraying operation. The glass beads shall be applied at the rate of 250 grams per square metre area.

The minimum thickness specified is exclusive of surface applied glass beads. The method of thickness measurement shall be in accordance with Appendices B and C of BS - 3262 (Part 3). The finished lines shall be free from ruggedness on sides and ends and be parallel to the general alignment of the carriageway. The upper surface of the lines shall be level, uniform and free from streaks

Measurements for Payment

The painted markings shall be measured in sq. metres of actual area marked (excluding the gaps, if any).

In respect of markings like directional arrows and lettering, etc., the measurement shall be by numbers.

Rate

The Contract unit rate for road markings shall be payment in full compensation for furnishing all labour, materials, tools, equipment, including all incidental costs necessary for carrying out the work at the site conforming to these Specifications complete as per the approved drawing(s) or as directed by the Engineer and all other incidental costs necessary to complete the work to these Specifications.

2005A RAISED PAVEMENT MARKERS – ROAD STUDS

MATERIAL

Road studs are moulded of Acrylonitrile Butadiene Styrene (ABS) conforming to ASTM Specification D1788 – 68, Class 5-2-2 shell filled with inert, thermosetting compound and filler. The lens portion of the marker is of optical methyl methacrylic.

CONSTRUCTION

The Road Stud shall be constructed of high impact ABS containing a multi-biconvex glass lens reflector system. It shall be of monolithic construction, and not less than 98.5mm². The height of the marker shall not exceed 17mm and the underside shall contain a non-honeycomb base (flat).

REQUIREMENTS

The markers shall conform to the following requirements:

a) Colour

Shall be white, yellow or red as specified and the Retro – reflectance values should conform to the testing procedures of ASTM E 809.

b) Impact Resistance

The marker shall not crack or break when tested using a 1000gram weight from a height of 1 metre. (ASTM D 2444) or BS 3900 Part E3.

c) Resistance to Water Penetration

There shall be no water penetration behind the lens after submerged in a water bath at 70 + 50oF for 10 minutes. And it should still meet the reflectance Requirement as stipulated by BS 998.

d) Heat Resistance

Shall comply with the initial brightness as per BS 873 Part IV of 1978

e) Night Visibility

The marker shall be brightas per BS 873 Part IV of 1978

f) Compression Resistance

There shall be no cracking sound at a pressure lower than 25 tones as per BS 873 Part IV of 1978.

g) Corrosion Resistance

After immersing a sample of Road stud in a solution containing 30g/l of sodium chloride for thirty (30) days, there shall not be any signs of corrosion, (BS 998).

Note: These markers are intended for application directly to pavement surfaces and are compatible with raised pavement makers. These adhesives should be of high quality and tested for conformance to customer requirements.

ADHESIVES

i) They shall be of Resin Type - Epoxy of 2 different components Part 1 and 2 i.e. Adhesive and Reactor without any volatile solvents in both.

ii) Pot life: not less than 20 minutes at 20°C

iii) Rotational cure time: between 20 and 30 minutes at 20°C

iv) Hard cure: Between 40 and 60 minutes at 20°C

APPLICATION INSTRUCTION

Preparation of Pavements

Make sure that the road surface is absolutely dry and free of oil and grease.

Mixing of Adhesive

Pour component B into the container of component A. Stir mixture by hand with a wooden or metal stick until uniform Grey Tint without a striate is obtained.

Installation

Pour the mixture on to the underside of the road stud. Then place the road stud firmly on the road surface. Adhesive should stand out for about 5mm to 10mm over the edges of the stud.

Protection from the Traffic

Protect studs from traffic for 2 hours until the adhesive has properly hardened. Try by touching the adhesive.

Number of studs needed for laboratory tests

In order to approve a particular type of road stud, 4 sample road studs of each colour shall be submitted.

2006 GUARDRAILS

Under(a) (ii) Posts, add:

Steel sections for posts placed above box culverts shall be IPE 140 or as otherwise directed by the Engineer. The steel shall conform to AASHTO MI83. Galvanizing shall be in accordance with AASHTO MIII.

Add the following at the end:

(e) Reflectors on guardrails

As shown on the drawings reflectors (type 'Swareflex' or similar) should be placed on guardrails.

2007 KERBS

Add the following to Clause 2007 of the Standard Specification

a) Vertical Joints

Vertical joints between adjacent kerbs shall not be greater than 10 mm in width and shall be filled with a mortar consisting of 1:3 cement: sand by volume.

b) Transition between Flush and Raised Kerbs

The transition between flush and raised kerbs (e.g. at bus bays) shall be termed as ramped kerbs. The transition between flush and raised kerbs shall occur within a length of 2.0 m.

2010 TREES

Trees will be planted according to the advice given by the District Forest Officer and the rate shall allow for transportation to site, planting as directed by the Engineer, watering during the first dry season after the planting, and protection until the end of the Maintenance Period.

2012 RETRO-REFLECTIVE ROAD STUDS “Cats eyes”

All retro-reflective road studs shall comply with BS 873: Part 4. The contractor shall provide details and the manufacturer’s certificate of the studs he proposes to use in the works to the Engineer for approval. The studs shall be installed at locations shown on drawings or instructed by Engineer.

The studs are moulded of Acrylonitrile Butadiene Styrene (ABS) conforming to ASTM Specification D1788-68, class 5-2-2 shell filled with inert, thermosetting compound and filler. The lens portion of the marker is of optical methyl methacrylic.

The road stud shall be constructed of high impact ABS containing a multi-biconvex glass lens reflector system. It shall be of monolithic construction, and not less than 98.5mm². The height of the marker shall not exceed 17mm and the underside shall contain a non-honeycomb base (flat).

The colours shall be white, yellow or red and the retro-reflectance complying to ASTM E 809. The impact resistance shall be to ASTM D 2444 or BS 3900 part 3. The studs shall be resistant to water penetration and corrosion resistant to BS 998. The adhesive shall be of resin type Epoxy of part 1 (adhesive) and part 2 (reactor) without any volatile solvents in both and have pot life of not less than 20mins at 20°C.

2013 ROAD HUMPS

Where shown on the drawings or directed by the Engineer, the Contractor shall provide, place, trim, shape and compact to line and level road humps.

Road humps shall be constructed in asphaltic concrete or concrete class 20/10 to the dimensions shown on the drawings or directed by the Engineer.

Road humps should be painted with white thermoplastic paint of 45 ° diagonal strips as shown on the drawings.

2014 FLAT TOPPED ZEBRA CROSSING

Where shown on the drawings or directed by the Engineer, the Contractor shall provide, place, trim, shape and compact to line and level flat-topped zebra crossing

2015 SERVICE DUCTS

Where instructed by the Engineer, the Contractor shall construct services ducts beneath the carriageway and shoulders/footpaths. The ducts shall consist of 150 mm PVC ducts. The minimum clearance between the road formation and the top of the duct surround shall be 100 mm.

2016 DUCT MARKER POSTS

Duct markers shall be installed by the Contractor at each end of the services ducts provided under clause 2015. The duct marker shall be located immediately beyond the outer edge of the shoulder or footpath and as close to the line of the duct as physical constraints permit. Where several ducts are laid side by side, only one duct marker post will be necessary. The duct marker posts shall be constructed as shown on the Drawings and shall be clearly and durably marked on the side facing away from the road. The marker post shall be inscribed “X ducts” where X is the number of ducts laid in the group marked by the marker post.

2017 CULVERT MARKER POSTS

Culvert markers shall be installed by the Contractor at each end of culverts constructed along the project road. The culvert marker shall be located immediately beyond the outer edge of the shoulder or footpath and as close to the line of the culvert as physical constraints permit. Where several culverts are laid side by side, only one culvert marker post will be necessary. The culvert marker posts shall be constructed as shown on the Drawings and shall be clearly and durably marked on the side facing away from the road. The marker post shall be inscribed “X culverts” where X is the number of culverts laid in the group marked by the marker post

2018 BOLLARDS

Where shown on the Drawings or instructed by the Engineer, the Contractor shall construct permanent bollards. The bollards shall be precast using a class of concrete as shown on the drawings.

2019 PLOT BOUNDARY BEACONS

Where shown on the Drawings or instructed by the Engineer, the Contractor shall construct plot boundary beacons. The plot boundary beacons shall be 1.2m long reinforced concrete post with 150x150mm cross-section founded on 450x450x350 mass concrete as shown on the drawings.

2020 CHANNEL BLOCKS

The Contractor shall provide, lay and joint 125x100mm channel blocks to roads, footpaths and shoulders as shown on the Drawings or instructed by the Engineer.

2021 MEASUREMENT AND PAYMENT OF ITEMS 2012 TO 2020

Item: Reflective road studs

Unit: No.

Road studs shall be measured by the number instructed. The rate shall include for the cost of provision and transport of all materials, preparation of the road surface, application of adhesives and full compliance with the manufacturer's instructions.

Item: Road humps

Unit: m

Road humps shall be measured by the length installed. The rate shall include for provision, installation and compaction to the satisfaction of the Engineer and removal of surplus material.

Item: Flat topped zebra crossing

Item: Service ducts

Unit: m

Service ducts shall be measured by the metre as the length of duct installed as per the Engineer's instructions. The rate shall include for providing all materials, excavation, installation of PVC ducts, backfilling to the formation level, compaction, all in accordance with clause 2015.

Item: Duct Marker Post

Unit: No

Duct marker posts shall be measured by the number instructed. The rate shall include for provision and installation of posts, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Culvert marker post

Unit: No

Culvert marker posts shall be measured by the number instructed. The rate shall include for provision and installation of posts, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Bollards:

Unit: No

Bollards shall be measured by the number instructed. The rate shall include for provision and installation of bollards, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Plot boundary beacons

Unit: No

Plot boundary beacons shall be measured by the number instructed. The rate shall include provision, transport of materials, excavation, erection of beacons and backfill, compaction to the satisfaction of the Engineer.

Item: Channel blocks

Unit: m

SECTION 22 – DAYWORKS

2202 MEASUREMENT AND PAYMENT

Where items of major equipment listed in the schedule of Dayworks are specified by type (e.g. concrete mixer e.t.c.) the power rating of such items of equipment to be provided by the Contractor shall not be lower than the power ratings of such equipment, manufactured within the last two years prior to the date of Tender. Any item of major plant employed upon Dayworks which has a power rating lower than specified shall be paid for at rates lower than those in the schedule of Dayworks. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified above.

SECTION 23 – STREET LIGHTING

1. Scope

This specification covers supply, testing at works and site, erection, testing and commissioning and handing over of complete street lighting and area lighting installation.

2. Standards

All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Kenyan Standard Code of Practice or the British Standard Code of Practice in the absence of Kenyan Standard.

3. General

The street lighting installation for the project shall be carried out by use of outdoor type, weatherproof luminaries, to be mounted on tubular steel poles or galvanized iron poles or FRP coated steel poles.

Electric power supply at 415 volt, three phase, four wire, 50 Hz to be tapped from the street lighting Feeder Pillar.

The electric power shall be distributed to the street lighting poles through electric cables laid below ground or through PVC sleeve embedded into concrete and shall be distributed equally on three phase of the electric power supply system.

Individual control MCB/Fuses with Pole junction box shall be provided on each pole. The terminal box shall be weather proof, having gasketed cover.

The street light poles shall be earthed individually with pipe electrode type earth station as detailed in the drawing using 25 mm diameter galvanized iron pipe 2.5 m long.

Electric cable required for the street lighting installation shall be 1100 Volt grade, PVC insulated and sheathed, armoured cable having stranded Aluminium conductor of rating as mentioned in the drawing.

For automatic ON/OFF operation of the street lights, quality make automatic timer, type TSQ-T (Day dial – 1 x 24 hour) or equivalent shall be provided in the street light feeder pillar.

All street lights shall be controlled from the outdoor type street light control pillars the locations of which are shown on the drawings.

4. Lighting Poles

The street lighting installation for the project shall be carried out by use of out door type, weatherproof luminaries, to be mounted on tubular steel poles or galvanized iron poles or FRP coated (coating thickness to be 2.0 mm minimum) as steel poles. The street light poles shall be fabricated from heavy duty cold rolled steel tubes confirming BS 1840 as appropriate tubular, swaged welded poles.

The street light pole shall be swaged poles made from steel of ultimate tensile strength of 410 MPa (42 Kgf/mm²). The pole height above ground shall be 9.2 Mtrs. Hot dip galvanized inside and outside confirming to BS 729 Part I, BS 5135, The galvanizing shall be 65 microns and shall be recorded and results finished while bidding.

The street light poles shall be provided with suitable size base plate/sleeve, and necessary fixture mounting bracket at top.

The terminal box shall be provided with Epoxy terminals and fuses to be mounted on the pole with damp.

Pole shall have large diameter entries for outgoing wires and one earth stud.

The pole fabrication shall conform to the drawings and where such drawing is not available; the Contractor shall make such drawing and get it approved before fabrication.

The pole foundation shall house as shown on the drawings.

For fixing earth wire one bolt shall be welded to the pole and provided with suitable nut washer and spring washer.

The pole shall be manufactured as per BS code and test certificates shall be submitted to Engineer-in-Charge for approval.

5. Pole Terminal Box

The junction box enclosure shall be made up of cast Aluminium or FRP weather proof, splash proof, vandal proof enclosure suitable for mounting on pole externally with suitable clamping arrangement. The enclosure shall have recessed hinged door with neoprene gasket and locking arrangement.

Each enclosure shall be adequately sized to house terminal blocks to loop in and out 2 Nos. 4C x 25/35 mm² cables, Neutral link and 2 Nos., 10 A MCB s/HRC Fuses with base. All above components to be rigidly mounted on back plate.

Suitable size removable type gland plate at the bottom shall be provided for loop in and out of 2 Nos., 4c x 25 mm² armoured cables by means of heavy duty compression type brass gland with brass cone and ring arrangement for effective earthing/bonding of cable armour and pole body. Non Fading/Non Chalking point colour to the approved shade shall be provided in case of FRP coated poles. The box shall have earth terminal on inside and outside for connecting earthwire.

3C x 2.5 mm² lead wire shall be multi strand copper conductor, Special heat resistant PVC/PVC insulated cable to be provided from the pole terminal box to the street light fittings.

6. Pole Bracket

The pole bracket shall be suitable for erection of street light fittings with Sodium Vapour/Mercury Vapour Lamp, on the pole top. Pole bracket shall be made from 60 mm diameter 'B' class galvanized iron pipes.

A stopper shall be provided with 3 Nos., holes at 120 degrees for proper fixing of the bracket on the pole top as shown on the drawing.

7. Street Lighting Fittings Suitable for Son-T (+) Lamps

Street light fittings shall be integral type and suitable for 250W/150W SON-T (+) lamps and of the makes such as PHILIPS and other quality brands as specified by the Engineer:

The body and the control gear housing shall be in single piece and made from full die cast housing made out of LM6 aluminium. The body shall be phosphated, primer coated and finished with hammer and tone Grey epoxy powder coated on the outside and white inside.

The fitting shall be complete with control gear tray including Electronic igniters, PF improvement capacitor, copper wound heavy duty polyester filled ballast, earthing terminal, connector block etc. 250W hi-pressure metal halide lamp in IP 54 shall have an average 100 lux and uniformity factor of >0.5.

The Control gear tray shall be detachable so as to remove the same for maintenance without disturbing the fitting fixed on the pole.

The fitting shall have porcelain 3-pin BC/ES or GES screwed type (depending on the lamp) lamp holder fitted on a special bracket so as to raise or lower the same to achieve cut-off or semi cut-off light distribution.

Electro chemically brightened and anodized, scratch free, pot mirror type reflectors with smooth and glossy surface for optimum light reflection shall be provided. It should be possible to remove the reflectors for cleaning without disturbing the lamps.

The cover shall be made from toughened, heat resistant glass uniform thickness and moulded. The cover shall be fixed with to the fitting toggle switches and with neoprene rubber/synthetic/felt gasket impregnated with insect repellent solution.

The fitting shall be fixed to pole bracket or directly on the pole as the case may be, with fixing clamps.

The fitting shall be insect and weather proof confirming to relevant BS protection rating.

8. Street Light Control Pillar

The control pillar shall be suitable for outdoor installation and all relevant codes of practices shall be applicable. The pillar shall be weather proof and water proof and shall be as per the details shown on the drawing. The control pillar shall be made from 2.5 mm CRCA sheet steel/or FRP enclosure of adequate thickness.

The control pillar shall have 2 separate compartments with separate doors. One compartment shall be for incoming supply switch gears and energy meter etc., and for local Power Authority's use and shall have sealing arrangement. The other compartment for consumer

use shall have control and power switchgears for outgoing. All the equipment in the pillar shall be erected on 2 mm thick galvanized iron plate, and this plate shall be properly connected to the earth bar.

All power and control wiring inside the control pillar shall be with stranded copper conductor wires with lugs clamped at both the ends. For termination of incoming and outgoing cables, epoxy insulators with studs and locknuts shall be provided. A detachable gland plate made out of 3 mm thick galvanized iron/aluminium sheet shall be provided at the pillar bottom. Toner control for switching streetlights ON/OFF to be provided.

Contractor to provide KWH meter and CT's as approved by the power supply company and get the same calibrated before installation. Certificate shall be submitted after commissioning the equipment. Cables at feeder pillar shall be terminated at the bottom gland plate, by heavy duty compression type of gland plate, earthing tags for effective earthing of cable armour and PVC cable shroud shall be provided.

Feeder pillar foundation shall be class 20/20 concrete, 600 mm above ground level.

9. Pole Foundation

The pole foundation shall be of concrete class 20/20 and size shown in the drawing with necessary excavation in all types of soil, murum or rock.

A circular shaped plinth of size shown on the drawing above ground level shall be provided. The plinth shall be plastered smoothly and painted with 2 coats of Cement paint from all sides and the pole terminal box shall be embedded in the plinth in such a way that the outer cover is flushed with the plinth plaster. The plinth shall be of concrete Class 20/20 and it shall be cast along with foundation.

10. Pipe Type Earthing for Light Feeder Pillar

A GI Pipe of 38 mm. dia. 3.5 metre long shall be provided with a funnel on the top of pipe. A funnel with wire mesh that is used for pouring of water shall be screwed to the pipe. The pit shall be free from hard rock and surrounding soil shall be damp. Alternate layers of a homogenous mix of charcoal alt and low resistivity soil shall be provided for refilling the earthing pit. The depth of earthing pit should be 3.5 metres. The lower part of pipe (about 1.5 meter) shall have holes of 12 mm dia. At the interval 150 mm. Earthing resistance shall not exceed more than 3 Ohms.

11. Earthing

One number with 25 mm diameter 2.5 metre long galvanized iron pipe electrode with perforation holes shall be provided for each pile. For earthing of the poles and pillars 2 Nos. 8 SWG galvanized iron earth wires from each earthing electrodes shall be connected with nuts and washers to the earthing bolts welded to the electrode and pole.

For earthing poles on RCC structures, 8 SWG GI-earth wire shall be laid along with the cable inside the duct provided in structure to be terminated at pole terminal box. The earthing pit shall be provided at both ends at ground level, to connect with the solid earth.

For earthing of the pole terminal box an earth wire of size 12 SWG galvanized iron shall be provided and connected between earth nut bolt on the pole and the pole terminal box.

For earthing of the lighting fittings third core of the lead wire shall be used and connected between pole terminal box to the fittings.

12. Earth pits

Solid block masonry chamber plastered smooth inside shall be constructed up to 450 mm resting on PCC below ground. A Cast Iron Chamber Frame with concealed hinged CI cover with lifting look shall be embedded in concrete on top of the chamber.

An earthing lead shall be brought out by fixing GI strip of 50 x 6 mm and by using 9 mm dia GI/Brass nut bolt, and set of washers. Suitable GI Clamps shall be provided on the GI pipe inside chamber for taking tap off for earthing leads.

13. Measurement and Payments

Measurement and payment for all street-lighting works shall be in accordance with the items listed in Bill of quantities, the preamble to Bill of quantities and the specifications above.

SECTION 24 - CONCRETE PILING WORK FOR STRUCTURES

2401 BRIDGE FOUNDATIONS AND SITE INVESTIGATIONS

This Section covers all foundation work, which for the purposes of these Specifications shall comprise those elements of construction below the top surface of; the footings, the pile-capping slabs, or the caisson cover slabs, collectively hereinafter referred to as bases, which shall also include all the associated temporary works.

2402 SITE INVESTIGATIONS

(a) General

The Contractor may be required to arrange to carry out geotechnical investigations in accordance with BS CP 2001 at the proposed bridge locations and in liaison with the Engineer prior to commencing construction works. This is to verify the accuracy and reliability of the original site investigations upon which the substructure designs and construction details have been based.

The investigations are to include assessment of safe design parameters for the proposed piled and spread foundations by an independent approved geotechnical testing laboratory. For each bridge location, the Contractor shall supply three copies of the results of the investigations to the Engineer in an approved standard reporting format.

In the event the report indicates that changes in the original designs and construction details are necessary due to the prevalent site conditions, the Engineer will revise/update substructure designs and construction details to suit the site conditions indicated by the investigations. Revised structural drawings will be issued and other related details will then be issued during the construction period.

(b) Scope of Site Investigations

The scope of the site investigations at each location may include trial pits, core drilling and some of the following tests on recovered soil samples depending on the prevalent sub-soil conditions:

Standard penetration test (SPT)

Unconfined Compression Tests on rock core samples

Moisture, density, shear box and plasticity index tests

Ground water monitoring

(c) Ground Bearing Pressure at Bridge Sites

The design ground bearing pressure for the foundations for the bridges, except Bridge No. 16, is 300KN/m². This is to be verified for each bridge site during the construction stage. For this very bridge No. 16, which is founded on friction piles, the soil properties at the bridge site shall be tested in order to verify the carrying capacity of the piles.

(d) Measurement and Payment for Additional Site Investigations

Payment shall be made for each confirmatory hole drilled as instructed by the Engineer. The work authorised by the Engineer shall be in accordance with the provisions of the Conditions of Contract.

2403 CAST-IN-PLACE REINFORCED CONCRETE FRICTION PILING

(a) Materials

Material used in the permanent foundation work shall comply with the requirements specified for the particular material under this clause.

(i) Rock (for rock fill)

Stones shall be hard, angular, natural or quarry stones of such quality that they will not disintegrate on exposure to water or weathering. Crushed stone used as stone fill shall originate from sound unweathered rock approved by the Engineer. The stones shall be free from soil, clay or organic material. Not more than 10% of the total volume of rock fill shall consist of stones with a mass of less than 0.5 times the specified mass and not more than 10% of the total volume of rock fill shall consist of stones with a mass of more than 5 times the specified mass. At least 50% of the total volume of rock fill shall consist of stones the mass of which exceeds the specified mass.

(ii) Granular fills

Granular material used for constructing the compacted granular fill shall be approved granular material of at least gravel subbase quality.

(iii) Sand fills

Sand used for filling the caissons shall be clean, hard sand free from lumps of clay or organic or other deleterious matter.

(iv) Pile casings

Pile casings shall have sufficient strength not to be distorted during the concreting process, and they shall be sufficiently watertight to prevent water leaking through the casing walls during the placing of concrete.

(v) Grouting

The grout shall consist of Portland cement, water and a plasticizing admixture (Sika PowerPlus or approved equivalent) to improve workability. The water/cement ratio shall be as low as possible consistent with the necessary workability.

(vi) Concrete

Concrete for cast-in-place piles shall be a rich coherent mix of high workability and cement content meeting all requirements for the specified class as provided below.

Portland cement concrete requirements

Max. size of Coarse Aggregate	28 days compressive Strength (min)	Consistency (range in slump)		Maximum Permissible water/cement ratio water/cement ratio
(mm)	(N/mm ²)	(mm)	(mm)	
20	30	150	180	0.5

Workability and slump requirements are given in the table below:

Piling Mix Workability	Slump		Typical Conditions of Use
	Minimum (mm)	Range (mm)	
A	75	75 - 150	Placed into water-free unlined or permanently lined bore of 600 mm diameter or over, or where casting level lies below temporary casing; reinforcement widely spaced, leaving ample room for free movement of concrete between bars
Piling Mix Workability	Slump		Typical Conditions of Use
	Minimum (mm)	Range (mm)	
B	100	100 - 200	Where reinforcement is not spaced widely; where cut-off level of concrete is within temporary casing; where pile bore is water-free and the diameter is less than 600 mm
C	150	150 or more	Where concrete is to be placed by tremie under water or drilling mud or by pumping.

The Contractor shall submit the details of the proposed additive for the Engineer's approval with appropriate supporting data on laboratory trial mix results. The dosing of retarders shall ensure initial setting time of not less than five (5) hours corresponding to the ambient temperature at which the concreting is proposed to be carried out.

(b) Founding

In consequence of possible variations of the anticipated founding conditions, the dimensions and founding levels specified or shown on the Drawings may have to be varied during construction in accordance to Conditions of Contract.

No bases, caissons or piles shall be founded unless authorised by the Engineer. Each founding level shall be accurately measured and recorded and agreed on. The term “founding level” used in these Specifications shall be deemed to have the following meanings in respect of:

(i) Foundation fills

The surface of the in-situ material that has been prepared to receive foundation fills.

(ii) Bases

The underside of the base

(iii) Piles

The underside of the under-ream, bulbous base or rock socket, the tip of the pile shoe or lower pile end, as may be relevant.

(iv) Caissons

The underside of the cutting edge

(c) Foundation Fill

If it is found during the course of excavation that the material at the indicated founding depth does not have the required bearing capacity as specified on the Drawings, the excavations shall be extended at the discretion of the Engineer until satisfactory founding material is encountered. The Engineer may order the Contractor to make up the difference in levels with foundation fill.

Where the foundation fill consists of rock or crushed stone, it shall be constructed in accordance with the requirements of these Specifications or as directed by the Engineer. Foundation fill consisting of granular material shall be constructed in layers not exceeding 150mm in thickness after compaction. Each layer shall be moistened or dried to the optimum moisture content for the material and compacted to a density of not less than 100% MDD (AASHTO T-99). Mass concrete fill to be used shall be of the class or mix of concrete fill as specified or directed by the Engineer.

A concrete blinding which complies with the requirements shown on the Drawings shall be placed underneath all bases except where mass concrete fill is used or where authorized by the Engineer that this need not be done.

Where mass concrete fill is constructed under a base it shall be constructed accurately to the final levels of the underside of the base.

(d) Foundation Piling

Piling of the foundations to Bridge No. 16 shall entail the following:

Cast-in-situ and properly vibrated reinforced concrete friction piles with circular cross sections as illustrated by the drawings

Pile bore shall be excavated by rotary and/or percussive means using short augers, buckets, grabs or other boring tools to advance the open bore. Temporary casing shall be used to support the wall of the bore prior to concreting, subject to the approval of the Engineer

All holes shall be drilled to the tip elevation determined from investigations and approved by the Engineer. Rejected boreholes shall be filled with Class 20/20 concrete by the Contractor at his own expense

The Contractor shall take all such measures and provide such strengthening and bracing as is necessary and to the approval of the Engineer to ensure that the temporary casing is not disturbed, overturned, over-stressed or under-eroded in any condition and shall be such that it will not disturb the freshly cast concrete and/or permanent lining and/or reinforcement

The temporary casing shall be free from significant distortion and/or shall be uniform cross-sections throughout each continuous length. During concreting they shall be free from encrusted concrete or any internal projections which might prevent the proper formation of the pile

The piles shall be cast in pre-bored cavities with retractable steel tube linings

The casting process shall be carried out in lifts of not more than 900mm

After each pour, the casing shall be retracted allowing for an overlap of 150mm between the casing and the concrete

The concrete shall be thoroughly vibrated before the next lift is poured

(e) Code of Practice

All workmanship, materials, tests and performance in connection with the piling work are to be in conformity with the B.S. Code of Practice CP 8004: Foundations.

(f) Setting Out

The Contractor will be responsible for setting out the substructure bases and the positions of piles and shall maintain the setting out of the substructure bases, whilst carrying out his work.

No separate payment shall be made for this work and the Contractor must make allowance for this in his rates for piling.

(g) Lengthening of Piles

Where it becomes necessary to lengthen a pile at the top, the Contractor shall submit his proposal to the Engineer for his approval.

(h) Construction Requirements

The diameter and length of reinforced concrete piles shall be detailed by the Contractor as shown on the shop drawings and will not have permanent lining. Drawings shall be submitted to the Engineer for approval.

Concrete shall meet all the specified requirements for Class 30/20.

A permanent lining of at least 10 mm thickness shall be provided in all cast in-situ bored piles constructed over water or very soft ground, or as directed by the Engineer.

(i) Position and Cut-Off Levels of Piles

All piles are to be formed to within 75 mm of the position shown on the drawings, and no pile shall deviate from the vertical alignment by more than one half (0.5) degree. If any pile deviates from the required position by more than this amount, the Contractor will be required to provide two further piles free of charge, or alternatively, will be required to pay the additional cost of enlarging the pile caps. No method of forcible correction will be permitted.

(j) Obstructions

Should the Contractor encounter, in the driving or boring of piles or linings any unnatural obstructions which cannot be removed or displaced by normal methods, he shall immediately inform the Engineer who may order the obstruction to be removed, payment being made by Day works Rates, or the pile to be relocated.

If a bored pile is to be relocated, the hole for the original pile shall be cleaned out and backfilled, to the satisfaction of the Engineer, with Class 30/20 concrete to the level approved by the Engineer. The Contractor will be paid for the work at the same rate as for the good piles, the payment length being from the cut-off level directed by the Engineer to the base of the hole.

In the event that the Engineer orders the obstruction to be removed, then the standing time for the piling rig in excess of two hours from the time of informing the Engineer of the obstruction shall be paid by the rig hour rate. This rate shall be deemed to cover all the costs incurred by the rig standing. Standing time less than 2 hours from the time of informing the Engineer of the obstruction will not be paid for.

(k) Preparation for Concreting

The Contractor shall not proceed with the concreting of the pile until the Engineer gives specific approval to do so after satisfying himself of the following:

Adequacy of the Contractor's equipment and arrangement.

Proficiency of his personnel.

Cleanliness of the borehole, and

Contractor shall have suitable lighting arrangements at all times for the Engineer to inspect the entire length of the shells, pipe or hole before placing the reinforcing steel or concrete.

Prior to concreting a pile, a sample of slurry shall be taken from the base of the borehole using an approved sampling device and its specific gravity shall be determined and submitted for the Engineer's approval.

(l) Placing of Concrete

The tremie shall be of not less than two hundred and fifty (250) mm diameter made of watertight construction.

The means of supporting the tremie shall be such as to permit the free movement of the discharge end of the concrete.

The tremie pipe shall be fitted with a travelling plug, which shall be placed at the top of the pipe before charging the tremie pipe with concrete, as a barrier between the concrete and water, so as to prevent water entering the tube and mixing with the concrete

The tremie shall be carefully lowered into the borehole, so that the end of the tube shall rest at about one hundred and fifty (150) mm above the bottom of the borehole, with reinforcement; the borehole, and the hopper end of the tremie tube shall be filled with concrete as aforesaid. It shall be slightly raised, so that when the concrete reaches the bottom it flows out of the lower end of the tube and fills the bottom of the borehole.

Thereafter, the rate of withdrawal of the tremie shall be gradual so as to ensure the end of the tremie pipe is always one and a half (1.5) metres below the top of the concrete in the borehole.

An allowance shall be made for the top five hundred (500) mm of concrete in the borehole during concreting being unsatisfactory.

When the next batch is placed in the hopper, the tremie shall be slightly raised but not out of the concrete at the bottom, until the batch discharges to the bottom of the hopper. This operation shall be controlled by calculating the volume of concrete required to fill one linear meter of pile and then by measuring the rate of withdrawal of the tube corresponding to the volume of the batch in the hopper. The flow shall then be retarded by lowering the tube.

The depth of the concrete in the borehole shall be measured at intervals to keep a. constant check that the tremie pipe bottom is immersed in concrete.

Concreting in each pile shall be carried out in a continuous operation without stoppages until the pile has been completed.

The Contractor shall take precautions to ensure that the concrete is free of voids and shall prevent the entry of water and/or collapse of soil into concrete.

Concreting shall continue until the concrete has reached an elevation of five hundred (500) mm higher than the designated pile cut off level shown on the shop drawings or as otherwise directed by the Engineer.

The concrete shall be placed in one continuous operation from tip to cut-off elevation and shall be carried out in such a manner as to avoid segregation. The method of placing the concrete and the consistency (slump) shall be to the satisfaction of the Engineer.

No shell or pipe shall be filled with concrete until all adjacent shells, pipes or piles within a radius of three (3) m or five (5) times the pile diameter: whichever is greater, have been driven to the required resistance.

(i) Withdrawal of temporary casing

If the method of construction involves withdrawal of temporary casing as concreting proceeds a sufficient head of concrete shall be maintained above the bottom of the temporary casing to ensure that no voids are formed within the pile and to prevent the entry of ground water and to prevent the collapse of soil into the concrete.

If such entry or collapse should occur, the temporary casing shall be re-driven before the concrete has set and all defective concrete shall be removed or the construction of the pile shall be abandoned, in which case the provision of the clause herein which refers to "Defective Piles" shall apply.

The withdrawal of the temporary casing shall be carried out before the adjacent concrete has taken its initial set.

The method and timing of withdrawal must be such as to ensure that the space between the pile and the surrounding ground shall be filled with concrete.

(ii) Cutting of Piles

Tops of piles shall be embedded in the concrete footing as shown on the shop drawings.

Concrete piles shall, when approved by the Engineer, be cut off at such a level that at least 50 mm of undamaged pile can be embedded in the structure above, but not more than 150 mm, unless otherwise specified or directed by the Engineer. If a pile is damaged below this level, the Contractor shall repair the pile to the satisfaction of the Engineer. The longitudinal reinforcement of the piles shall be embedded in the structure above to a length equal to at least (40) times the diameter of the main reinforcing bars.

When the cut-off elevation for a cast-in-place concrete pile is below the elevation of the bottom of the pile cap, the pile may be built up from the butt of the pile to the elevation of the bottom of the cap by means of a reinforced concrete construction method, to be submitted to the Engineer for approval

(iii) Defective Piles

Any pile completed with defects such as damage during casting in-situ, placed out of its proper location, incapable or partially capable of permanently carrying the load which it is intended to carry, driven below the elevation fixed by the Engineer, due to the immature setting of the concrete in the pile or due to cavity/collapse of the borehole fully or partially, or due to any cause of which the Engineer shall be the sole judge to determine, shall be corrected at the Contractor's expense by one of the following methods approved by the Engineer

A second pile shall be driven or cast adjacent to the defective pile

The Contractor shall undertake such additional tests/works as the Engineer may specify to provide additional foundations to supplement the defective piles and so modify the structure to be supported as to ensure that load will be transferred safely to the additional foundations of existing pile. The Contractor shall be responsible for the cost of such additional functions and tests and/or of the extra work carried out in such modifications to the structure.

A concrete pile shall be considered defective if it has a visible crack or cracks, extending around the perimeter of the pile, or any defect, which, in the opinion of the Engineer, affects the strength or service life of the pile.

When a new pile is driven or cast to replace a rejected one, the Contractor at his expense, shall enlarge the footing as deemed necessary by the Engineer.

(iv) Pile records

The Contractor shall keep records of the piles driven or installed. A copy of the record shall be given to the Engineer within two (2) days after each pile is driven. The record form to be used shall be approved by the Engineer.

On completion of the piling for each structure, the Contractor shall deliver to the Engineer a drawing recording the exact location and the final depth (tip elevation) of all piles.

(m) Site Supervision

Full details of the Personnel in charge of the piling operation, including their qualification and experience, shall be submitted by the Contractor to the Engineer for his approval. He shall also retain an approved and competent English-speaking foreman on the Works, while piling is in progress, and shall keep at the Site of the Works copies of all the drawings, Specifications, instructions and a complete log and records of all piles formed or driven with details of the set obtained, if any, and the actual length of each completed pile. These shall be available to the Engineer for inspection at all times. The Contractor shall provide necessary assistance to the Engineer to enable him to keep a similar record.

(n) Measurement and Payment

As for individual sections of the Standard Specification

2404 PROOF LOADING AND INTEGRITY TESTING OF PILES

(a) General

Piles selected by the Engineer shall be tested by proof loading and the Contractor shall give the Engineer at least 24 hours' notice of the commencement of the test. The test load shall be applied by a method agreed by the Engineer.

(b) Main piles

Test piles shall be main piles selected by the Engineer for test loading by one of the methods described herein and shall be tested after the pile has attained its characteristic strength. Main piles shall not be used as reaction piles.

(c) Measuring Devices

Load measuring devices shall be calibrated before and after each series of tests, whenever adjustments or replacements are made to the devices and at the intervals recommended by the manufacturer of the equipment. Pressure gauges and hydraulic jacks shall be calibrated together. Certificates of calibration from a testing laboratory approved by the Engineer for such calibration shall be supplied to the Engineer.

The Contractor's proposed method of measuring the movement of pile heads shall be submitted to the Engineer for his agreement.

(d) Test Loading of Working Piles

(i) General

Each increment of load shall be measured within an accuracy of 2%. Movements shall be measured within an accuracy of 0.25 mm. An independent reference frame or wire shall be set up to permit measurement of pile movement. Dial gauges shall be accurate to within 0.1 mm. Overall movements shall be checked by optical or any other leveling method agreed with the Engineer by reference to an external datum.

Where required by the Engineer, working piles shall be subjected to test loads of up to 1.5 times its nominal working load. The test load shall not be applied by jacking against the adjacent working piles, but by jacking against additional piles installed for that purpose, or by jacking against Kent ledge, heavier than the required test load, placed on a platform supported well clear of the test pile.

The Contractor shall prepare and submit to the Engineer for agreement, his proposals for carrying out the test loading, including the method of extending the pile to ground level, if necessary, and full details of the methods of applying the load and measuring loads and deflections. A copy of the current certificates of calibration of the approved load measuring apparatus shall be submitted to the Engineer, prior to any test loading being applied to a pile.

The deflections of the head of the test pile shall be accurately measured in relation to an undisturbed datum.

Piles shall not be loaded until the Contractor has received the Engineer's approval of his proposals

(ii) Procedure

The Contractor shall give the Engineer not less than 24 hours' notice of his intention to commence the application of the test load.

The test load equal to the nominal working load shall be applied in four equal increments. The intermediate load shall be maintained until the rate of change of deflection of the test pile is less than 0.1 mm in 30 minutes. The working load of the pile shall be maintained for a period of not less than 12 hours and the total movement recorded before unloading. Load is taken off in four equal intervals with holding time of 10 minutes for each interval.

After 1 hour, the test load equal to 150 percent of the nominal working load shall be reapplied in increments of 25 percent of the nominal working load. The intermediate loads corresponding to 25, 50, 75, 100, 125 and 150 percent of the nominal working load shall be maintained until the rate of change of deflection of the test pile is less than 0.2 mm in 30 minutes. The load corresponding to 150 percent of the nominal working load shall be maintained for 24 hours and the total movement recorded.

The load shall then be reduced to zero in decrements of 25 percent of the nominal working load. Each load shall be maintained until the rate of change of deflection of the test pile is less than 0.35 mm in 30 minutes

(iii) Records

The progressive deflection of the pile head shall be measured accurately throughout the whole Period of the test

Readings for the unloading and intermediate test loads should be taken at about 1, 2, 4, 8, 15 and 30 minutes after each change in loading and thereafter at least every 30 minutes.

Two copies of the test records shall be supplied to the Engineer within 24 hours of the completion of a pile test. The records shall give the dates and times of load application and removal, the load-pile deflection and time-pile deflection relationships, both in tabular and graphical form, reference number of the load measuring apparatus and details of any special Circumstances relating to the pile test.

(iv) Limits of settlement

The maximum settlement of the pile head permitted shall be 4 mm under the nominal working load and 6 mm for 1.5 times the working load. The piling scheme put forward by the Contractor must meet these requirements and the Contractor must guarantee that the piles will carry the required loads without exceeding the specified deflection

(e) Pile Integrity Testing

The Contractor and the Engineer shall agree during the pre-start or subsequent progress meetings on when a visit to piling sites shall be allowed for carrying out integrity testing or the minimum number of piles to be tested at each site.

The Contractor shall invite the Engineer to inspect the pile testing sites 24 hours before testing commences. Site preparation shall specifically meet the following conditions:

The piles shall be trimmed down to sound concrete

The Contractor shall provide safe access for the testing technicians to gain access to the head of each pile.

The pile cap/ground beam excavations must be clear of any standing water

The pile cap or ground beam reinforcement must not be in place,

Although a thin layer of blinding can be in place around the pile, it must neither cover the pile nor be greater than 75mm thick.

(f) Defective Piles

If, in the opinion of the Engineer, any pile is incapable or only partially capable of permanently carrying the load which it is intended to carry, as determined by the pile test or by reason of ground water or soil having entered during construction, or the strength of concrete (as shown by the results of the cube tests) being below that specified, or the pile having been constructed outside the permitted tolerances or having been damaged by the construction of any other pile nearby or otherwise, or failure to conform in any other respect to the requirements of the Contract, then the Engineer will require the Contractor to submit for approval his proposals for

making good any defective work or inadequate pile all at his own expense. The Contractor's programme must thus allow for sufficient time for dealing with any potential anomalies.

(g) Measurement and Payment

Integrity testing of every individual pile and full kentledge testing of a small sample of the total number of piles – 4no shall be undertaken.

SECTION 25 - HIV/AIDS, GENDER ISSUES, SOCIAL ISSUES AND LOCAL PARTICIPATION

25 01 SCOPE

This specification sets out the Contractor's obligations with regard to on-site HIV/AIDS awareness campaign and preventive measures which are to be instituted.

25 02 INTERPRETATION AND DOCUMENTATION

The following documents shall inter-alia be read in conjunction with this specification:

The Conditions of Contract;

The Drawings;

25 03 GENERAL REQUIREMENTS

(a) HIV/AIDS Awareness Campaign

The Contractor shall institute an HIV/AIDS awareness campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to display AIDS awareness posters in all buildings frequented by workers employed on the contract, where such buildings fall under the control of the Contractor. In addition, at least three (3) of the Contractor's vehicles, regularly used on site shall display HIV/AIDS awareness posters. The posters shall be printed on gross paper and shall be at least A1 size on buildings and A3 size, or other approved size on vehicles. The message on the posters shall be supplied by the Employer through the Engineer before the posters are printed.

Aids awareness shall also be included in the orientation process of all workers employed on the contract.

(b) HIV/AIDS Prevention Campaign

The Contractor shall institute an HIV/AIDS prevention campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to make condoms available to workers. The condoms shall be from an approved manufacturer. The Contractor shall make available at least 1,000 condoms every month, through dispensing machines or other approved method of distribution. The Contractor shall at all times keep the site adequately supplied with the condoms.

(c) HIV/AIDS Training

- Introduction

HIV/AIDS is having a significant and increasing impact in Kenya. Statistics show a prevalence of 10-15% along some of the major roads in the country. Interventions that stimulate the movement of people increase both the exposure to the HIV virus and the spread of the virus. Road construction has been identified as one such intervention.

MOR policy is to integrate HIV/AIDS awareness and prevention into all road construction and rehabilitation programmes. This is in accordance with the Third National Strategic Plan (2000-5) for HIV/AIDS prevention and control as approved by the Government of Kenya, International Bank for Reconstruction and Development (IBRD) and many other organizations. It is a contractual requirement to carry out HIV/AIDS awareness and prevention activities during the construction period as provided in this specification.

- Objective

The objective is to reduce the risk of exposure to and spread of the HIV virus in the area of the construction. The target group will be local labourers and their Engineers employed by the works contractors. The wider community will benefit indirectly through their normal day-to-day interaction with the target group.

- Scope of activities

Activities for HIV/AIDS awareness and prevention will be broad-based targeting both individuals and groups. They may consist of:

Information posters in public places both on and offsite (eating houses, bars, guest houses, etc.) and on contractor's vehicles)

Availability of socially marketed condoms, Peer educators (reference people) drawn from the local labour and educated in HIV/AIDS issues for discussions with colleagues (estimate 1 per 100 employees),

Small focus group discussions and information covering key issues,

Theatre groups and video presentations,

Promotional events (such as football matches) to encourage openness and discussion of HIV/AIDS issues,

Promotional bill boards to raise awareness of the integration of construction and HIV/AIDS activities,

Inclusion of HIV/AIDS activities at site meetings with the District Aids Committee and other approved representatives.

Availability of promotional materials such as T-shirts, caps, bumper stickers, key rings, etc.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the labourers, determined by participatory approaches to ensure they are appropriate, desired and have a public health impact. The scale and frequency of activities may also be adjusted to suit requirements of the target group. Education will cover:

preventive behaviours including partner reduction, condom use, awareness and importance of treatment of sexually transmitted incidences (STIs); skills including negotiating safer sex, correct condom use, purchase without embarrassment; and referral to local health centres and services available.

Tasks to support the above activities will be to:

Establish the status and focus of all current and planned HIV/AIDS activities in the area to ensure complementarity and determine potential involvement in project activities.

Carry out a brief review of regional activities combining road construction with HIV/AIDS campaigns to determine options, best practice key issues, constraints, etc.

Review of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials.

Provide education and training for site personnel, Engineers and peer educators for the scope of activities as above.

Provide supervision for peer educators to ensure sustained quality of education. Incentives for their continual work may be small promotional items such as T-shirts, caps, etc.

Provide mechanisms for the social marketing of condoms and distribution of materials.

Monitor activities regularly to assess effectiveness and impact. This should include an initial, interim and final assessment of basic knowledge, attitude and practices (KAP) taking account of existing data sources and recognizing the limitations due to the short time frame to show behaviour change. The KAP will be supported by qualitative information from focus group discussions.

- Collaboration

HIV/AIDS activities are co-ordinated nationally by the National Aids Control Council (NACC).

Activities on the construction site will be linked as far as possible with ongoing HIV/AIDS awareness and prevention in the area. This will ensure complementarity of approaches, reinforcing education and minimizing duplication. In addition, these links will ensure that the target group will have access to continued information after the end of the construction period.

- Contractor Responsibilities

The Contractor will designate a qualified HIV/AIDS expert, to be approved by the Engineer, who will work closely with the Client, MOH and other implementing agencies to support the HIV/AIDS awareness and prevention activities. This will ensure maximum effectiveness and integration with construction activities. Specific but not exclusive issues to be addressed by the Contractor are:

Scheduling of appropriate timing and duration for the implementation of HIV/AIDS activities as part of workplan for labourers and Engineers.

Designated rest times such as lunch breaks and pay days should be excluded.

Identification of suitable individuals for education from recruitment records with the implementing organisation.

Provision of suitable sites for communication activities and for condom distribution.

Monitoring of the implementation of peer educator activities.

Provision of support as necessary to the implementing organisation

- Inputs

An organisation experienced in the provision of HIV/AIDS awareness and prevention activities will be selected as a subcontractor to provide the above scope of activities on behalf of the main Contractor.

- Reporting

The implementing organisation will produce the following reports to be submitted to the Employer and NACC:

monthly progress briefs for inclusion in site meetings.

quarterly reports detailing activities carried out, issues, follow up, etc.

a review report of activities in the road construction sector,

a review report of existing IEC materials with recommendations for development of materials specifically for the road sector.

a final report detailing the methodology and activities carried out under this project including lessons learnt, impact, liaison with the Contractor and other parties, etc.

In addition, a report with the recommended approach for integration of HIV/AIDS awareness and prevention activities in the road construction sector will be produced. This will be a synthesis of project activities including contractual approaches, communication activities, availability of materials, liaison with existing organizations, etc. It will be developed with all parties involved in the construction activities to ensure that wide range of views and experiences is gained.

The final report and recommended approach will be presented to the Employer, NACC and other interested organizations including private sector, funding agencies and NGO's.

- Timing

Activities shall commence at the start of the construction period and continue throughout the Contract duration to ensure a sustained impact. Reporting and dissemination activities shall continue for three months after the project is completed to ensure integration into current practice.

25 04 MEASUREMENT AND PAYMENT

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaigns. The tendered rate shall include full compensation for equipment, labour and material required for the provision of the service.

Any amount required under this item will be approved by the Engineer, prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum expended.

APPENDIX TO SECTION 25 OF SPECIAL SPECIFICATIONS

HIV AND AIDS KNOWLEDGE, ATTITUDE AND PRACTICES SURVEY

Kenya National Highways Authority (KeNHA) is a statutory body established by the Kenya Roads Act, 2007. KeNHA is responsible for the Management, development, rehabilitation and maintenance of national trunk roads comprising of classes A, B and C roads totaling approximately 14,000km. KeNHA's vision is to be a leading Highways Authority committed to quality, safe and adequate national roads. The mission of KeNHA is to construct and manage national trunk roads that enhance socio-economic growth and prosperity.

KeNHA acknowledges the impact the roads construction has on HIV and AIDS along the communities it serves due to the immigrations of workers into the roads construction. Further, improved transportation infrastructure results in greater mobility, particularly for young people and men, and increased travel outside the local area to seek paid work. Reports indicate that the people most vulnerable to HIV during infrastructure construction are skilled and semiskilled male workers including machine operators, drivers including truck drivers that are categorized as most at risk populations, supervisors, manager, engineers - and young, rural, poorly educated women who move to the construction sites to sell sex. New roads also bring more truck drivers through an area – hard to reach men who often missed by HIV interventions. New roads can also increase trafficking of drugs through previously remote areas, as well as the risk of trafficking in people, both men and women, for their labour, and women and children for sexual exploitation.

The Lokichar-Loichangamatak road project is one of the KeNHA's initiatives supported by the World Bank through the Northern Corridor Transport Improvement Project that is aimed at for HIV/AIDS intervention measures. The road is approx. 40 kilometres long in Turkana County.

As a national Environmental requirement an Environmental and Social Impact Assessment was undertaken and an EIA license was issued prior to commencement of the project. One of the key anticipated negative impacts highlighted in the ESIA was the possibility of increased spread of HIV in the area that already had recorded highly concentrated HIV and AIDS prevalence. It is in this regard that an HIV and AIDS mitigation measure was put in place in order to enhance reduction of new HIV and AIDS infections that may emanate as a result of the road infrastructure construction.

The road construction is contracted to
.....under the supervision of
.....as the supervising engineers.
.....is undertaking the supervision of the contract including the HIV and AIDS mitigation. The Contract document section 25 stipulates the provision of HIV and AIDS in the project whose objective is to reduce the risk of exposure to the spread of the HIV virus in the area of construction. This section also articulates the essence of focusing the HIV and AIDS interventions on the needs of the target group as a means to enhance evidence based programming a requirement for NACC current strategic plan.

It is in this effort that the contracted HIV/AIDS consultant..... in collaboration withis undertaking HIV/AIDS survey. This survey will act as a source of baseline information for programming of the HIV and AIDS interventions.

The overall objective of the survey is to establish baseline for HIV and AIDS programming among the workers on the construction project. The specific objectives of the survey are:-

- To determine worker's knowledge on their vulnerability to HIV and AIDS
- To establish workers' practices and attitudes towards their sexual health
- To establish outlets and choices for their sexual health

The survey will employ both quantitative and qualitative methods of data collection through questionnaires, focus group discussions and key informant interviews. The research respondents will mainly be the workers who will be targeted through the questionnaires, focus group discussions and key informant interviews. The community will be targeted through focus group discussions and key informant interviews

OBJECTIVE OF THE KAP STUDY

The objective is to reduce the risk of exposure to the spread of the HIV virus in the area of construction. The target group will be the local labourers and their supervisors employed by the works contractors. The wider community will benefit indirectly through their day-to-day interaction with the target group.

The main focus of this project is HIV prevention. It is therefore important to know the levels of knowledge on all aspects of HIV as well as the attitudes and behaviours that can lead to

transmission of the virus. Data from the survey will be used to target the workers with specific behaviour change communication; it is therefore important to analyze the data by gender as well as by location

SAMPLE AND TARGET GROUPS

As a result of consultation process the target group will be 40% of those employed directly by the construction firm which total to respondents. This will be applied across all the sectors/sections or cadres as illustrated bellow.

Site Office

DEPARTMENTS	TOTAL NO OF EMPLOYEES	NUMBER TARGETED (40%)
Administration		
Workshop		
Laboratory		
Survey		
Asphalt Section		
Quarry section		
Concrete section		
GCS/DBM section		
Earthworks		
Total		

Site office

DEPARTMENTS	TOTAL NO OF EMPLOYEES	NUMBER TARGETED (40%)
Key staff		
Laboratory		
Survey		
Administration		
Inspectorate		
Drivers		
Total		

JUSTIFICATION

Knowledge of HIV/AIDS and its prevention

Knowledge of HIV/AIDS is found to be extremely high in most parts of the country. 99.1% of Kenyans' being aware of the disease called AIDS; KDHS 2003, which found that 99% of respondents were aware of HIV and AIDS. When analyzed by sex, 94.5% of women (14 out of 254 not aware) and 99.6% of men (1 out of 269 not aware) were aware. This can be analyzed by sites.

The initial focus should be on knowledge of HIV and AIDS, methods of prevention, cultural practices increasing, transmission, stigma and HIV and AIDS services available in the community.

Respondents who are aware of HIV and AIDS can then be asked, unprompted, what a person can do to avoid getting HIV. Examples of the unprompted answer always revolve around the following issues;

Abstain

Use of condom

Limit to one partner

Limit number of partners

Avoid sex with people with many partners

Avoid sex with homosexual

Avoid sex with drug user

Avoid blood transfusion

Avoid injections

Avoid sharing blades or razors

Avoid kissing

Avoid mosquito bites

Seek protection from traditional healers

Avoid sharing utensils

Following on from the unprompted question on prevention, statements will be read out to the respondents, stating both correct and incorrect methods of prevention/transmission of HIV/AIDS. The respondents are asked to either say 'yes', 'no' or 'don't know' to each statement. The purpose of this set of questions is to see not only the correct knowledge of prevention/transmission, but to find out how many respondents reject common myths/misconceptions. Examples of the questions are listed below;

Can ignoring community norms result in HIV infection?

Can people protect themselves from the virus that causes AIDS by using a condom correctly every time they have sex?

Can people get HIV from mosquito bites?

Can people protect themselves from AIDS by having one uninfected faithful partner?

Can people get the AIDS virus by sharing a meal with someone who is infected?

Can people protect themselves from the AIDS virus by abstaining from sexual intercourse?

Can having sex with a virgin or small girl cure a person from HIV/AIDS?

Can people get the AIDS virus by kissing someone who is HIV positive?

These statements knowledge will highlight the knowledge gap between men and women in these communities. Major myths/misconceptions within the communities; for example, that HIV can be transmitted by mosquitoes and that sharing a meal with someone who is HIV positive can lead to HIV infection should be spelled out. The question on community norms, relates to the fact that some people believe that not following certain cultural traditions or practices can lead to HIV infection.

‘Having sex with a small girl or virgin can cure a person from HIV/AIDS’ and the question on kissing.

Cultural practices

There are many cultural practices that can contribute to the spread of HIV/AIDS, and the respondents should be asked, unprompted, to name these. The responses can be

Widow inheritance

Inheriting sister of deceased wife

Wife or husband sharing

Sex connected with farming calendar

Sex with a virgin/small girl

Circumcision

Scarification

HIV and AIDS services in the community

Although the project is focusing on prevention of HIV and AIDS, it will also strengthen linkages between the communities and both formal and informal health services as well as community support groups. The respondents will be asked to name any services in their community that are available to help fight HIV and AIDS. The questions are unprompted and the respondents are encouraged to name as many services as they know, including;

Home based care

Condom distribution via CHWs/CBDs

Orphan support by CBO

IGA by PLHIV

VCT

Patient support centre

CBO/welfare group

Self-help group

Health facilities

A knowledge level of community services is key to help fight HIV/AIDS.

Stigma towards HIV-infected people

Questions will be asked to the respondents, to measure their attitudes towards people living with HIV. Some of these questions were taken from the KDHS 2003, and others are adapted to be more specific to the communities.

Would buy fresh vegetable from a vendor with AIDS

Would be willing to share a meal with a person with AIDS

Would want the HIV-positive status of a family member to remain secret

Would be willing to care for a relative with HIV/AIDS at home

Believe positive workers should be allowed to work

HIV status

The respondents will be asked if they have ever been tested for HIV, and if so, where/how. The respondents were not asked to reveal their status, if known.

Those respondents who had been tested for HIV are asked where they were last tested e.g.

VCT centre

Mobile VCT

MCH clinic

Health facility

Donated blood

METHODOLOGIES

The survey will be based on a quantitative research method:

Self-administration questionnaires – in combination with structured face-to-face interview, where self-administration is completely impossible;

Distribution and collection of the questionnaires – in most of the cases the questionnaires will be distributed directly in the setting of recruitment after a preliminary introduction to the project and its objectives and after agreement of the respondents to take part at the survey. After filling

out the questionnaires will be also collected on the spot, in an completely anonymous form (in a small box etc.).

Languages of the questionnaires – they will be in english

Research assistants – Project partners are responsible for the organisation and the survey's administration on the spot. They will contract, train and monitor the work of the selected interviewers/questionnaire administrators in cases those will be additionally involved in the survey.

Respondents' incentives – there are no incentives foreseen for the respondents (member of each survey's target groups), as far as the self-administration questionnaire is not lengthy and time-consuming task).

BASELINE SURVEY ON THE LEVEL OF HIV/AIDS AWARENESS, SOCIO-ECONOMIC IMPACT, PREVENTION AND CONTROL PRACTICES ALONG PROJECT ROAD CONSTRUCTION SITE

Introduction and consent

{NAME OF CONSULTANT} is conducting a baseline survey which will inform the implementation of a project on HIV/AIDS awareness campaign along project road construction site. In this survey we are seeking the views people on the issues pertaining to prevention of HIV infection and provision of care to those infected and affected. We would really appreciate if you can kindly take a moment to answer a few questions. Information obtained in this baseline survey is confidential and will only be used for the stated purpose. Would you be willing to participate?

(Signature of the respondent certifying that informed consent has been given verbally)

(Signature of interviewer certifying that informed consent has been given verbally by the respondent)

SECTION A: Socio-Demographic data. Remarks

1	Sex of Respondent	1. <15 yrs <input type="checkbox"/> 2. 15-49 yrs <input type="checkbox"/> 3. >50 yrs <input type="checkbox"/>	
2	Date of birth		
3	Marital status		
4	Where were you born	1. In the communities adjacent to project road 2. Elsewhere in Kenya 3. Outside Kenya 4. Don't know	
5	Sex	1. Male 2. Female	
6	What is your marital status	1. Single 2. Married 3. Divorced 4. Widowed	
7	Do you have children?	1. Yes 2. No	
	If yes, how many?	1. One – Two 2. Three – five 3. Six & More 4. Not Applicable	
8	Religion?	1. Christian 2. Muslim 3. Other	
9	Highest level of education obtained	1. Primary 2. Secondary 3. Tertiary College 4. University	
10	Are you employed in the construction site/offices	1. Yes 2. No	If yes skip Q9
11	Occupation?	1. Unemployed 2. Farmer and agricultural based occupations 3. Formal Employment 4. Business	
12	Do you or your partner have to work away from one another for long periods of time?	1. Yes 2. No	

SECTION B. HIV/AIDS Knowledge & Awareness			
1	Have you heard of HIV and AIDS?	1. Yes 2. No	
2	From where have you received information about HIV and AIDS? [choose all that apply]	1. School 2. Church 3. Training/workshop/information session 4. Radio, television 5. Brochure/leaflet/other printed material 6. Friends 7. Community/social workers 8. Public rallies/ awareness campaigns 9. Not Applicable	
3	What is HIV and AIDS?		
4	Is there a difference between HIV, and AIDS?	1. Yes 2. No	
5 6	How do people contract HIV and AIDS? [choose all that apply]	1. Having unprotected sex 2. Transfusion of blood or other blood products that contain HIV 3. Needle sharing (for IDU, tattoo) with HIV positive person 4. Mother to child transmission 5. Other , please mention 6. Don't know	
	Who is at most risk to get HIV and AIDS and why (name three groups)?		
6	What do you think would prevent you from getting infected by HIV? [choose all that apply]	1. Practice Abstinence 2. Be faithful 3. Practice safe sex 4. Not sharing needles and other skin piercing devices 5. Don't Know	
7	Do you know where someone can get services listed below in this community?	1. Voluntary Counseling and Testing (VCT) 2. Prevention of Mother to child transmission (PMCT) 3. Anti-Retroviral Therapy (ART) 4. Information, Education and Communication (IEC) on HIV	
8	Do you know anybody who is HIV positive?	1. Yes 2. No	

SECTION B. HIV/AIDS Knowledge & Awareness			
9	If yes how are they related to you?	1. Spouse/partner 2. Sibling 3. Parent 4. Aunt/uncle 5. Cousin 6. Other	
10	Have you ever been tested for HIV and AIDS	1. Yes 2. No	
11	When were you tested last	1. < six months ago 2. < one year ago 3. > one year ago	
12	Why does somebody go for an HIV test? Give three reasons.		
13	Are there health facilities private or public nearby? Name them		
14	Are you aware of the following services offered in health facilities;	a. VCT(voluntary testing and counseling) b. PMTCT (prevention of mother to child transmission) c. PEP(post exposure prophylaxis)	

SECTION C: Attitudes and stigma towards people living with HIV/AIDS.

1	Can you eat with an HIV + person? If yes why?	1. Yes 2. No	
2	Would you buy fresh vegetables from a vender with HIV/AIDS?	1. Yes 2. No	
3	Can you work with an HIV + person? If yes why?	1. Yes 2. No	
4	Would you want the HIV positive status of a family member to remain a secret?	1. Yes 2. No	

SECTION D: Culture and the spread of HIV/AIDS

1	Are there cultural practices in your community that you think may promote the spread of HIV/AIDS?	1. Yes 2. No	
2	Name cultural practices in your community that you think may promote the spread of HIV/AIDS	1. Widow/widower inheritance 2. Sex connected with farming calendar 3. Circumcision 4. scarification 5. other	
3	Can ignoring community norms result into HIV/AIDS?	1. Yes 2. No	

SECTION E: Risk assessment

1	Are you sexually active?	1. Yes 2. No	
2	How many sexual partners have you had in the last three months?	1. One 2. >2 3. Can't tell	
3	Did you use protection?	1. Yes 2. No	
	If not, why?		
4	Briefly describe how you would limit your chances of Being HIV infected.		

Thank you for your time and sincere responses.

LOKICHAIR-LOICHANGAMATAK REHABILITATION PROJECT

ACTIVITIES	SUB ACTIVITIES	INDICATORS	TIMELINE (QUARTERLY)	RESPONSIBILITY

SECTION 26 – ROAD SAFETY CAMPAIGN

26 01 SCOPE

This specification sets out the Contractor's obligations with regard to on-site road safety campaign which is to be conducted during the construction period. The aim of this road safety campaign is to achieve safe road use in the project area.

Indeed, improved roadway complete with paved surface will undoubtedly encourage more vehicular traffic and will allow vehicles to travel at higher average speeds. This will increase the possibility for accidents between vehicles, and with non-motorized traffic such as cyclists, pedestrians and both domestic and wild animals.

Although the improved road will be wider in certain areas and dangerous curves will be straightened, thus making it safer to travel at higher speeds, there is still likelihood of collisions between vehicles and with vehicles and bicycles, pedestrians, and livestock (and wildlife).

Due to poor road conditions over the years, people, animals, NMTs, and particularly children are unaware of the danger of a fast approaching vehicle and may cross the road in front of it. This impact is likely to be serious during daytime hours when traffic is heavier and when drivers are able to move faster.

Thus the Contractor shall conduct a road safety campaign in order to increase the awareness of the dangers of the road among the public alongside the project road and its workers.

26 02 GENERAL REQUIREMENTS

(a) Road safety prevention campaign

The Contractor shall institute a road safety campaign amongst his workers and the public for the duration of the contract. As part of the campaign the Contractor will be required to display road safety posters in all buildings frequented by workers employed on the contract, where such buildings fall under the control of the Contractor, and in all schools and public buildings

within the road project area. In addition, at least three (3) of the Contractor's vehicles, regularly used on site shall display road safety posters. The posters shall be printed on gross paper and shall be at least A1 size on buildings and A3 size, or other approved size on vehicles. The message on the posters shall be supplied by the Employer through the Engineer before the posters are printed.

(b) Road safety training

- Objective

The objective of the road safety campaign is to reduce the risk of exposure to road accidents in the area of the construction. The target group will be the public alongside the road, especially the children in schools and the chiefs of the village, but also local labourers and their supervisors employed by the works contractors. The wider community will benefit indirectly through their normal day-to-day interaction with the target group.

Scope of activities

Activities for road safety awareness will be broad-based targeting both individuals and groups. They may consist of:

- (i) Information posters in public places both on and offsite (eating houses, bars, guest houses, etc.) and on contractor's vehicles,
- (ii) Peer educators (reference people) drawn from the local labour and educated in road safety issues for discussions with colleagues or the public,
- (iii) Small focus group discussions and information covering key issues,
- (iv) Theatre groups and video presentations,
- (v) Promotional events (such as football matches) to encourage openness and discussion of road safety issues,
- (vi) Promotional bill boards to raise awareness of the integration of construction and road safety activities,
- (vii) Availability of promotional materials such as T-shirts, caps, bumper stickers, key rings, etc.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the public and the workers, determined by participatory approaches to ensure they are appropriate, desired and have a public impact. The scale and frequency of activities may also be adjusted to suit requirements of the target group. Education will cover:

preventive behaviours including safe road crossing, walking on shoulders and not on the road; referral to local information centres and services available.

Tasks to support the above activities will be to:

Establish the status and focus of all current and planned road safety campaign activities in the area to ensure complementarity and determine potential involvement in project activities.

Carry out a brief review of regional activities combining road construction with road safety campaigns to determine options, best practice key issues, constraints, etc.

Review of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials.

Provide education and training for site personnel, supervisors and peer educators for the scope of activities as above.

Provide supervision for peer educators to ensure sustained quality of education. Incentives for their continual work may be small promotional items such as T-shirts, caps, etc.

Monitor activities regularly to assess their effectiveness and impact. This should include an initial, interim and final assessment of basic knowledge, attitude and practices (KAP) taking account of existing data sources and recognising the limitations due to the short time frame to show behaviour change. The KAP will be supported by qualitative information from focus group discussions.

Contractor Responsibilities

The Contractor will designate a qualified road safety expert, to be approved by the Engineer, who will work closely with the Client, MOTI and other implementing agencies to support the road

safety campaign activities. This will ensure maximum effectiveness and integration with construction activities. Specific but not exclusive issues to be addressed by the Contractor are:

Scheduling of appropriate timing and duration for the implementation of the road safety campaign as part the workplan.

Identification of suitable individuals for education from recruitment records with the implementing organisation.

Provision of suitable sites for communication activities.

Monitoring of the implementation of peer educator activities.

Provision of support as necessary to the implementing organisation

Inputs

An organisation experienced in the provision of road safety campaign will be selected as a subcontractor to provide the above scope of activities on behalf of the main Contractor.

Reporting

The implementing organisation will produce the following reports to be submitted to the Contractor, Engineer and Employer

monthly progress briefs for inclusion in site meetings.

quarterly reports detailing activities carried out, issues, follow up, etc.

a review report of activities in the road construction sector,

a review report of existing IEC materials with recommendations for development of materials specifically for the road sector.

a final report detailing the methodology and activities carried out under this project including lessons learnt, impact, liaison with the Contractor and other parties, etc.

- Timing

Activities shall commence at the start of the construction period and continue throughout the Contract duration to ensure a sustained impact. Reporting and dissemination activities shall

continue for three months after the project is completed to ensure integration into current practice.

26 03 MEASUREMENT AND PAYMENT

The payment for items in this clause shall include full compensation for all work associated with the provision of road safety campaign related services as specified.

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaigns. The tendered rate shall include full compensation for equipment, labour and material required for the provision of the service.

Any amount required under this item will be approved by the Engineer, prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum expended.

Environmental, social, health and safety requirements

*KeNHA's environmental, social, health and safety policies that will apply to the project are attached under **Volume 5 of 5**.*

Drawings

Contract Drawings

The Contract Drawings will be issued in the form of A3 size Book of Drawings. These drawings will be issued with the bidding documents.

Supplementary Information

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VIII. General Conditions (GC)

1.	General Provisions	295
1.1	Definitions.....	295
1.2	Interpretation.....	301
1.3	Communications	302
1.4	Law and Language.....	302
1.5	Priority of Documents.....	302
1.6	Contract Agreement.....	303
1.7	Assignment	303
1.8	Care and Supply of Documents	303
1.9	Delayed Drawings or Instructions	304
1.10	Employer's Use of Contractor's Documents	305
1.11	Contractor's Use of Employer's Documents	305
1.12	Confidential Details	306
1.13	Compliance with Laws	306
1.14	Joint and Several Liability	306
1.15	Inspections and Audit by the Bank	307
2.	The Employer	307
2.1	Right of Access to the Site.....	307
2.2	Permits, Licences or Approvals	308
2.3	Employer's Personnel	308
2.4	Employer's Financial Arrangements	308
2.5	Employer's Claims.....	309
3.	The Engineer	310
3.1	Engineer's Duties and Authority	310
3.2	Delegation by the Engineer.....	311
3.3	Instructions of the Engineer	312
3.4	Replacement of the Engineer	313
3.5	Determinations	313
4.	The Contractor.....	314
4.1	Contractor's General Obligations	314
4.2	Performance Security.....	315
4.3	Contractor's Representative.....	316
4.4	Subcontractors.....	317
4.5	Assignment of Benefit of Subcontract	318
4.6	Co-operation	318
4.7	Setting Out	318
4.8	Safety Procedures.....	319
4.9	Quality Assurance.....	319

4.10	Site Data.....	320
4.11	Sufficiency of the Accepted Contract Amount.....	321
4.12	Unforeseeable Physical Conditions	321
4.13	Rights of Way and Facilities.....	322
4.14	Avoidance of Interference.....	323
4.15	Access Route.....	323
4.16	Transport of Goods	323
4.18	Protection of the Environment	324
4.19	Electricity, Water and Gas	324
4.22	Security of the Site.....	327
4.23	Contractor's Operations on Site.....	327
4.24	Fossils	327
5.	Nominated Subcontractors	328
5.1	Definition of "nominated Subcontractor"	328
5.2	Objection to Nomination.....	328
5.3	Payments to nominated Subcontractors	329
5.4	Evidence of Payments.....	329
6.	Staff and Labour	330
6.1	Engagement of Staff and Labour	330
6.2	Rates of Wages and Conditions of Labour	330
6.3	Persons in the Service of Employer	330
6.4	Labour Laws	330
6.5	Working Hours.....	331
6.6	Facilities for Staff and Labour	331
6.7	Health and Safety	331
6.8	Contractor's Superintendence	333
6.9	Contractor's Personnel.....	333
6.10	Records of Contractor's Personnel and Equipment	333
6.11	Disorderly Conduct	333
6.12	Foreign Personnel	333
6.13	Supply of Foodstuffs.....	334
6.14	Supply of Water	334
6.15	Measures against Insect and Pest Nuisance	334
6.16	Alcoholic Liquor or Drugs.....	334
6.17	Arms and Ammunition	334
6.18	Festivals and Religious Customs	334
6.19	Funeral Arrangements.....	334
6.20	Prohibition of Forced or Compulsory Labour	335
6.21	Prohibition of Harmful Child Labour	335
6.22	Employment Records of Workers.....	335
6.23	Workers' Organisations	335
6.24	Non-Discrimination and Equal Opportunity.....	336
7.	Plant, Materials and Workmanship.....	336
7.1	Manner of Execution.....	336

7.2	Samples	336
7.3	Inspection	336
7.4	Testing	337
7.5	Rejection	338
7.6	Remedial Work	338
7.7	Ownership of Plant and Materials	339
7.8	Royalties	339
8.	Commencement, Delays and Suspension	339
8.1	Commencement of Works	339
8.2	Time for Completion	340
8.3	Programme	340
8.4	Extension of Time for Completion	342
8.5	Delays Caused by Authorities	342
8.6	Rate of Progress	343
8.7	Delay Damages	343
8.8	Suspension of Work	344
8.9	Consequences of Suspension	344
8.10	Payment for Plant and Materials in Event of Suspension	344
8.11	Prolonged Suspension	345
8.12	Resumption of Work	345
9.	Tests on Completion	345
9.1	Contractor's Obligations	345
9.2	Delayed Tests	346
9.3	Retesting	346
9.4	Failure to Pass Tests on Completion	346
10.	Employer's Taking Over	347
10.1	Taking Over of the Works and Sections	347
10.2	Taking Over of Parts of the Works	348
10.3	Interference with Tests on Completion	349
11.	Defects Liability	349
11.1	Completion of Outstanding Work and Remedying Defects	349
11.2	Cost of Remedying Defects	350
11.3	Extension of Defects Notification Period	350
11.4	Failure to Remedy Defects	351
11.5	Removal of Defective Work	351
11.6	Further Tests	351
11.7	Right of Access	352
11.8	Contractor to Search	352
11.9	Performance Certificate	352
11.10	Unfulfilled Obligations	352
11.11	Clearance of Site	352
12.	Measurement and Evaluation	353

12.1	Works to be Measured	353
12.2	Method of Measurement	354
12.3	Evaluation	354
12.4	Omissions.....	355
13.	Variations and Adjustments	356
13.1	Right to Vary.....	356
13.2	Value Engineering	356
13.3	Variation Procedure	357
13.4	Payment in Applicable Currencies.....	358
13.5	Provisional Sums	358
13.6	Daywork.....	359
13.7	Adjustments for Changes in Legislation.....	359
13.8	Adjustments for Changes in Cost	360
14.	Contract Price and Payment.....	362
14.1	The Contract Price	362
14.2	Advance Payment	363
14.3	Application for Interim Payment Certificates.....	364
14.4	Schedule of Payments	365
14.5	Plant and Materials intended for the Works	366
14.6	Issue of Interim Payment Certificates.....	367
14.7	Payment.....	368
14.8	Delayed Payment	369
14.9	Payment of Retention Money	369
14.10	Statement at Completion.....	370
14.11	Application for Final Payment Certificate.....	371
14.12	Discharge 371	
14.13	Issue of Final Payment Certificate.....	372
14.14	Cessation of Employer's Liability	372
14.15	Currencies of Payment.....	372
15.	Termination by Employer.....	373
15.1	Notice to Correct.....	373
15.2	Termination by Employer	373
15.3	Valuation at Date of Termination	375
15.4	Payment after Termination	375
15.5	Employer's Entitlement to Termination for Convenience.....	376
15.6	Corrupt or Fraudulent Practices	376
16.	Suspension and Termination by Contractor	377
16.1	Contractor's Entitlement to Suspend Work	378
16.2	Termination by Contractor.....	379
16.3	Cessation of Work and Removal of Contractor's Equipment	380
16.4	Payment on Termination.....	380
17.	Risk and Responsibility	381

17.1	Indemnities.....	381
17.2	Contractor's Care of the Works	382
17.3	Employer's Risks	382
17.4	Consequences of Employer's Risks.....	383
17.5	Intellectual and Industrial Property Rights	383
17.6	Limitation of Liability.....	384
17.7	Use of Employer's Accommodation/Facilities	385
18.	Insurance	385
18.1	General Requirements for Insurances	385
18.2	Insurance for Works and Contractor's Equipment	387
18.3	Insurance against Injury to Persons and Damage to Property	389
18.4	Insurance for Contractor's Personnel.....	390
19.	Force Majeure	390
19.1	Definition of Force Majeure	390
19.3	Duty to Minimise Delay.....	392
19.4	Consequences of Force Majeure	392
19.5	Force Majeure Affecting Subcontractor	392
19.6	Optional Termination, Payment and Release.....	392
19.7	Release from Performance.....	393
20.	Claims, Disputes and Arbitration.....	394
20.1	Contractor's Claims	394
20.2	Appointment of the Dispute Board	396
20.3	Failure to Agree on the Composition of the Dispute Board	397
20.4	Obtaining Dispute Board's Decision	397
20.5	Amicable Settlement.....	398
20.6	Arbitration.....	399
20.7	Failure to Comply with Dispute Board's Decision.....	400
20.8	Expiry of Dispute Board's Appointment	400

Section VIII. General Conditions (GC)

Kenya National Highways Authority

Upgrading of Lokichar - Loichangamatak (A1) Road

The General Conditions that follow are the Bank Harmonized Edition of the Conditions of Contract for Construction prepared and copyrighted by the International Federation of Consulting Engineers (*Fédération Internationale des Ingénieurs-Conseils*, or FIDIC), FIDIC 2010-All rights reserved. This publication is exclusive for the use of Bank Borrowers and their project implementing agencies as provided under the License Agreement dated March 11th, 2005, between the IBRD and FIDIC, and, consequently, no part of this publication may be reproduced, translated, adapted, stored in a retrieval system or communicated, in any form or by any means, whether mechanical, electronic, magnetic, photocopying, recording or otherwise, without prior permission in writing from FIDIC, except by the Employer identified above and only for the exclusive purpose of preparing these Standard Bidding Documents for the Contract also identified above.

General Conditions

1. General Provisions

1.1 Definitions

In the Conditions of Contract (“these Conditions”), which include Particular Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

1.1.1 The Contract

1.1.1.1 “Contract” means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 “Contract Agreement” means the contract agreement referred to in Sub-Clause 1.6 [Contract Agreement].

1.1.1.3 “Letter of Acceptance” means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 “Letter of Tender” means the document entitled letter of tender or letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.5 “Specification” means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 “Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

1.1.2 Parties and Persons

- 1.1.1.7 “Schedules” means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.
- 1.1.1.8 “Tender” means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract.
- 1.1.1.9 “Bill of Quantities”, “Daywork Schedule” and “Schedule of Payment Currencies” mean the documents so named (if any) which are comprised in the Schedules.
- 1.1.1.10 “Contract Data” means the pages completed by the Employer entitled contract data which constitute Part A of the Particular Conditions.
- 1.1.2.1 “Party” means the Employer or the Contractor, as the context requires.
- 1.1.2.2 “Employer” means the person named as employer in the Contract Data and the legal successors in title to this person.
- 1.1.2.3 “Contractor” means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).
- 1.1.2.4 “Engineer” means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer].
- 1.1.2.5 “Contractor’s Representative” means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [Contractor’s Representative], who acts on behalf of the Contractor.
- 1.1.2.6 “Employer’s Personnel” means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer;

and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer's Personnel.

1.1.2.7 "Contractor's Personnel" means the Contractor's Representative and all personnel whom the Contractor utilises on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.8 "Subcontractor" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.2.9 "DB" means the person or three persons appointed under Sub-Clause 20.2 [Appointment of the Dispute Board] or Sub-Clause 20.3 [Failure to Agree on the Composition of the Dispute Board]

1.1.2.10 "FIDIC" means the Fédération Internationale des Ingénieurs-Conseils, the international federation of consulting engineers.

1.1.2.11 "Bank" means the financing institution (if any) named in the Contract Data.

1.1.2.12 "Borrower" means the person (if any) named as the borrower in the Contract Data.

1.1.3 Dates, Tests, Periods and Completion

1.1.3.1 "Base Date" means the date 28 days prior to the latest date for submission of the Tender.

1.1.3.2 "Commencement Date" means the date notified under Sub-Clause 8.1 [Commencement of Works].

1.1.3.3 "Time for Completion" means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated in the Contract Data (with any extension under Sub-Clause 8.4 [Extension of Time for Completion]), calculated from the Commencement Date.

- 1.1.3.4 “Tests on Completion” means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Employer.
- 1.1.3.5 “Taking-Over Certificate” means a certificate issued under Clause 10 [Employer’s Taking Over].
- 1.1.3.6 “Tests after Completion” means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Employer.
- 1.1.3.7 “Defects Notification Period” means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], which extends over 365 days except if otherwise stated in the Contract Data (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections]..
- 1.1.3.8 “Performance Certificate” means the certificate issued under Sub-Clause 11.9 [Performance Certificate]..
- 1.1.3.9 “Day” means a calendar day and “year” means 365 days.

1.1.4 Money and Payments

- 1.1.4.1 “Accepted Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
- 1.1.4.2 “Contract Price” means the price defined in Sub-Clause 14.1 [The Contract Price], and includes adjustments in accordance with the Contract.
- 1.1.4.3 “Cost” means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

- 1.1.4.4 “Final Payment Certificate” means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].
 - 1.1.4.5 “Final Statement” means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].
 - 1.1.4.6 “Foreign Currency” means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.
 - 1.1.4.7 “Interim Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.
 - 1.1.4.8 “Local Currency” means the currency of the Country.
 - 1.1.4.9 “Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment].
 - 1.1.4.10 “Provisional Sum” means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].
 - 1.1.4.11 “Retention Money” means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause 14.9 [Payment of Retention Money].
 - 1.1.4.12 “Statement” means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.
- 1.1.5 Works and Goods**
- 1.1.5.1 “Contractor’s Equipment” means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor’s Equipment excludes Temporary Works, Employer’s Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

1.1.5.2 “Goods” means Contractor’s Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

1.1.5.3 “Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

1.1.5.4 “Permanent Works” means the permanent works to be executed by the Contractor under the Contract.

1.1.5.5 “Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.

1.1.5.6 “Section” means a part of the Works specified in the Contract Data as a Section (if any). 1.1.5.7 “Temporary Works” means all temporary works of every kind (other than Contractor’s Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

1.1.5.8 “Works” mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.1.6 Other Definitions

1.1.6.1 “Contractor’s Documents” means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

1.1.6.2 “Country” means the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.

1.1.6.3 “Employer’s Equipment” means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Employer.

1.1.6.4 “Force Majeure” is defined in Clause 19 [Force Majeure]..

- 1.1.6.5 “Laws” means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.6.6 “Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security]..
- 1.1.6.7 “Site” means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.
- 1.1.6.8 “Unforeseeable” means not reasonably foreseeable by an experienced contractor by the Base Date.
- 1.1.6.9 “Variation” means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].
- 1.1.6.10 “Notice of Dissatisfaction” means the notice given by either Party to the other under Sub-Clause 20.4 [Obtaining Dispute Board’s Decision] indicating its dissatisfaction and intention to commence arbitration.

1.2 Interpretation

In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing;
- (d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and
- (e) the word “tender” is synonymous with “bid” and “tenderer” with “bidder” and the words “tender documents” with “bidding documents”

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

In these Conditions, provisions including the expression "Cost plus profit" require this profit to be one-twentieth (5%) of this Cost unless otherwise indicated in the Contract Data.

1.3 Communications

Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Contract Data; and
- (b) delivered, sent or transmitted to the address for the recipient's communications as stated in the Contract Data. However:
 - (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
 - (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

1.4 Law and Language

The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.

The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.

1.5 Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of

interpretation, the priority of the documents shall be in accordance with the following sequence:

- (a) the Contract Agreement (if any),
- (b) the Letter of Acceptance,
- (c) the Letter of Tender,
- (d) the Particular Conditions – Part A,
- (e) the Particular Conditions – Part B
- (f) these General Conditions
- (g) the Specification,
- (h) the Drawings, and
- (i) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

1.6 Contract Agreement

The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the Particular Conditions establish otherwise. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

1.7 Assignment

Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party:

- (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party, and
- (b) may, as security in favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

1.8 Care and Supply of Documents

The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent

Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.

Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.

The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.

If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.

1.9 Delayed Drawings or Instructions

The Contractor shall give notice to the Engineer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.

If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

1.10 Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

- (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
- (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
- (c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted under this Sub-Clause.

1.11 Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Employer. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not,

without the Employer's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12 Confidential Details The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify compliance with the Contract and allow its proper implementation.

Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

1.13 Compliance with Laws The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Particular Conditions:

- (a) the Employer shall have obtained (or shall obtain) the planning, zoning, building permit or similar permission for the Permanent Works, and any other permissions described in the Specification as having been (or to be) obtained by the Employer; and the Employer shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and
- (b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.

1.14 Joint and Several Liability If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

- (a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;
- (b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and
- (c) the Contractor shall not alter its composition or legal status without the prior consent of the Employer.

1.15 Inspections and Audit by the Bank

The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank.

2. The Employer

2.1 Right of Access to the Site

The Employer shall give the Contractor right of access to, and possession of, all parts of the Site within the time (or times) stated in the Contract Data. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time is stated in the Contract Data, the Employer shall give the Contractor right of access to, and possession of, the Site within such times as required to enable the Contractor to proceed without disruption in accordance with the programme submitted under Sub-Clause 8.3 [Programme].

If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

2.2 Permits, Licences or Approvals

The Employer shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

- (a) copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- (b) any permits, licences or approvals required by the Laws of the Country:
 - (i) which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],
 - (ii) for the delivery of Goods, including clearance through customs, and
 - (iii) for the export of Contractor's Equipment when it is removed from the Site.

2.3 Employer's Personnel

The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other contractors on the Site:

- (a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and
- (b) take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

2.4 Employer's Financial Arrangements

The Employer shall submit, before the Commencement Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Clause 14 [Contract Price and Payment]. Before the

Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

In addition, if the Bank has notified to the Borrower that the Bank has suspended disbursements under its loan, which finances in whole or in part the execution of the Works, the Employer shall give notice of such suspension to the Contractor with detailed particulars, including the date of such notification, with a copy to the Engineer, within 7 days of the Borrower having received the suspension notification from the Bank. If alternative funds will be available in appropriate currencies to the Employer to continue making payments to the Contractor beyond a date 60 days after the date of Bank notification of the suspension, the Employer shall provide reasonable evidence in his notice of the extent to which such funds will be available.

2.5 Employer's Claims

If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [Electricity, Water and Gas], under Sub-Clause 4.20 [Employer's Equipment and Free-Issue Materials], or for other services requested by the Contractor.

The notice shall be given as soon as practicable and no longer than 28 days after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [Extension of Defects Notification Period].

This amount may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be

entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

3. The Engineer

3.1 Engineer's Duties and Authority

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as stated in the Particular Conditions. The Employer shall promptly inform the Contractor of any change to the authority attributed to the Engineer.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- (a) whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer;
- (b) the Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract;
- (c) any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances; and
- (d) any act by the Engineer in response to a Contractor's request except as otherwise expressly specified shall be

notified in writing to the Contractor within 28 days of receipt.

The following provisions shall apply:

The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions:

- (a) Sub-Clause 4.12: agreeing or determining an extension of time and/or additional cost.
- (b) Sub-Clause 13.1: instructing a Variation, except;
 - (i) in an emergency situation as determined by the Engineer, or
 - (ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.
- (c) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2.
- (d) Sub-Clause 13.4: Specifying the amount payable in each of the applicable currencies

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.

3.2 Delegation by the Engineer

The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and/or test items of Plant and/or Materials. The assignment,

delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties. However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations].

Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorised to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

- (a) any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Engineer to reject the work, Plant or Materials;
- (b) if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3 Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant:

- (a) gives an oral instruction,
- (b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and
- (c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).

3.4 Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. If the Contractor considers the intended replacement Engineer to be unsuitable, he has the right to raise objection against him by notice to the Employer, with supporting particulars, and the Employer shall give full and fair consideration to this objection.

3.5 Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars, within 28 days from the receipt of the corresponding claim or request except when otherwise specified. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

4. The Contractor

4.1 Contractor's General Obligations

The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country as defined by the Bank.

The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer..

If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall submit to the Engineer the Contractor's Documents for this part in accordance with the procedures specified in the Contract;
- (b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [Law and Language], and shall include additional information required by the Engineer to add to the Drawings for co-ordination of each Party's designs;

- (c) the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and
- (d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer the “as-built” documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer.

4.2 Performance Security

The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount stated in the Contract Data and denominated in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Employer. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer.

The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation, or as a result of a Variation, amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Engineer's request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.

4.3 Contractor's Representative

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked in terms of Sub-Clause 6.9 [Contractor's Personnel], or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].

The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4 [Law and Language]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.

4.4 Subcontractors

The Contractor shall not subcontract the whole of the Works.

The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor. Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
- (b) the prior consent of the Engineer shall be obtained to other proposed Subcontractors;
- (c) the Contractor shall give the Engineer not less than 28 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site; and
- (d) each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [Termination by Employer]..

The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [Confidential Details] apply equally to each Subcontractor.

Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Subcontractors.

4.5 Assignment of Benefit of Subcontract

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.

4.6 Co-operation

The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

- (a) the Employer's Personnel,
- (b) any other contractors employed by the Employer, and
- (c) the personnel of any legally constituted public authorities,

who may be employed in the execution on or near the Site of any work not included in the Contract.

Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to suffer delays and/or to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

If, under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Specification.

4.7 Setting Out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

The Employer shall be responsible for any errors in these specified or notified items of reference, but the Contractor

shall use reasonable efforts to verify their accuracy before they are used.

If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this e.

4.8 Safety Procedures The Contractor shall:

- (a) comply with all applicable safety regulations,
- (b) take care for the safety of all persons entitled to be on the Site,
- (c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- (d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Employer's Taking Over], and
- (e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9 Quality Assurance The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the

Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10 Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

- (a) the form and nature of the Site, including sub-surface conditions,
- (b) the hydrological and climatic conditions,
- (c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
- (d) the Laws, procedures and labour practices of the Country, and

- (e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11 Sufficiency of the Accepted Contract Amount

The Contractor shall be deemed to:

- (a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and
- (b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12 Unforeseeable Physical Conditions

In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Engineer may give. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

- (b) payment of any such Cost, which shall be included in the Contract Price.

Upon receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer shall take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor's interpretation of any such evidence.

4.13 Rights of Way and Facilities

Unless otherwise specified in the Contract the Employer shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.

4.14 Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with:

- (a) the convenience of the public, or
- (b) the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others.

The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15 Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated in these Conditions:

- (a) the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;
- (b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;
- (c) the Employer shall not be responsible for any claims which may arise from the use or otherwise of any access route;
- (d) the Employer does not guarantee the suitability or availability of particular access routes; and
- (e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16 Transport of Goods

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;

- (b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and
- (c) the Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.

4.17 Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

4.18 Protection of the Environment

The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

4.19 Electricity, Water and Gas

The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests.

The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specification. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

4.20 Employer's Equipment and Free-Issue Materials

The Employer shall make the Employer's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

- (a) the Employer shall be responsible for the Employer's Equipment, except that
- (b) the Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.

The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.

The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Specification. The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.

After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Employer of liability for any shortage, defect or default not apparent from a visual inspection.

4.21 Progress Reports

Unless otherwise stated in the Particular Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

Each report shall include:

- (a) charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
- (b) photographs showing the status of manufacture and of progress on the Site;
- (c) for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - (i) commencement of manufacture,
 - (ii) Contractor's inspections,
 - (iii) tests, and
 - (iv) shipment and arrival at the Site;
- (d) the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment];
- (e) copies of quality assurance documents, test results and certificates of Materials;
- (f) list of notices given under Sub-Clause 2.5 [Employer's Claims] and notices given under Sub-Clause 20.1 [Contractor's Claims];
- (g) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
- (h) comparisons of actual and planned progress, with details of any events or circumstances which may jeopardise the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22 Security of the Site Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall be responsible for keeping unauthorised persons off the Site, and
- (b) authorised persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by the Employer or the Engineer, as authorised personnel of the Employer's other contractors on the Site.

4.23 Contractor's Operations on Site

The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as additional working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land..

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfil obligations under the Contract.

4.24 Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the

Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

5. Nominated Subcontractors

5.1 Definition of "nominated Subcontractor"

In the Contract, "nominated Subcontractor" means a Subcontractor:

- (a) who is stated in the Contract as being a nominated Subcontractor, or
- (b) whom the Engineer, under Clause 13 [Variations and Adjustments], instructs the Contractor to employ as a Subcontractor subject to Sub-Clause 5.2 [Objection to Notification].

5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Employer agrees in writing to indemnify the Contractor against and from the consequences of the matter:

- (a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;
- (b) the nominated Subcontractor does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees; or
- (c) the nominated Subcontractor does not accept to enter into a subcontract which specifies that, for the subcontracted

work (including design, if any), the nominated Subcontractor shall:

- (i) undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge his obligations and liabilities under the Contract;
- (ii) indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities, and
- (iii) be paid only if and when the Contractor has received from the Employer payments for sums due under the Subcontract referred to under Sub-Clause 5.3 [Payment to nominated Subcontractors].

5.3 Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts shown on the nominated Subcontractor's invoices approved by the Contractor which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

5.4 Evidence of Payments

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- (a) submits this reasonable evidence to the Engineer, or
- (b)
 - (i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
 - (ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement,

then the Employer may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

6. Staff and Labour

6.1 Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing.

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the Country.

6.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

6.3 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Employer's Personnel.

6.4 Labour Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

6.5 Working Hours

No work shall be carried out on the Site on locally recognised days of rest, or outside the normal working hours stated in the Contract Data, unless:

- (a) otherwise stated in the Contract,
- (b) the Engineer gives consent, or
- (c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer.

6.6 Facilities for Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The

Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behaviour with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counselling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labour.

The Contractor shall include in the programme to be submitted for the execution of the Works under Sub-Clause 8.3 an alleviation programme for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation programme shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related specification. For each component, the programme shall detail the resources to be provided or utilised and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation. Payment to the Contractor for preparation and implementation this programme shall not exceed the Provisional Sum dedicated for this purpose.

**6.8 Contractor's
Superintendence**

Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

**6.9 Contractor's
Personnel**

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

- (a) persists in any misconduct or lack of care,
- (b) carries out duties incompetently or negligently,
- (c) fails to conform with any provisions of the Contract, or
- (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

**6.10 Records of
Contractor's
Personnel and
Equipment**

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

**6.11 Disorderly
Conduct**

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

6.12 Foreign Personnel

The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor

shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use his best endeavours in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel..

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

6.13 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Specification at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.

6.14 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.15 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

6.16 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereof by Contractor's Personnel.

6.17 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow Contractor's Personnel to do so.

6.18 Festivals and Religious Customs

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.

6.19 Funeral Arrangements

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.

6.20 Prohibition of Forced or Compulsory Labour

The Contractor shall not employ forced labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

6.21 Prohibition of Harmful Child Labour

The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where the relevant labour laws of the Country have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

6.22 Employment Records of Workers

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment].

6.23 Workers' Organisations

In countries where the relevant labour laws recognise workers' rights to form and to join workers' organisations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers' organisations, the Contractor shall enable alternative means for the Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labour laws are silent, the Contractor shall not discourage the Contractor's Personnel from forming or joining workers' organisations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organisations and bargain collectively. The Contractor shall engage with such workers' representatives. Workers' organisations are expected to fairly represent the workers in the workforce.

6.24 Non-Discrimination and Equal Opportunity

The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where the relevant labour laws provide for non-discrimination in employment, the Contractor shall comply with such laws. When the relevant labour laws are silent on non-discrimination in employment, the Contractor shall meet this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.

7. Plant, Materials and Workmanship

7.1 Manner of Execution

The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

- (a) in the manner (if any) specified in the Contract,
- (b) in a proper workmanlike and careful manner, in accordance with recognised good practice, and
- (c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2 Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for consent prior to using the Materials in or for the Works:

- (a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and
- (b) additional samples instructed by the Engineer as a Variation.

Each sample shall be labelled as to origin and intended use in the Works.

7.3 Inspection

The Employer's Personnel shall at all reasonable times:

- (a) have full access to all parts of the Site and to all places from which natural Materials are being obtained, and

- (b) during production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

7.4 Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

Except as otherwise specified in the Contract, the Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [Variations and Adjustments], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise

instructed by the Engineer, and the tests shall then be deemed to have been made in the Engineer's presence.

If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5 Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Engineer requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer.

7.6 Remedial Work

Notwithstanding any previous test or certification, the Engineer may instruct the Contractor to:

- (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,

- (b) remove and re-execute any other work which is not in accordance with the Contract, and
- (c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under sub-paragraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer all costs arising from this failure.

7.7 Ownership of Plant and Materials

Except as otherwise provided in the Contract, each item of Plant and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

- (a) when it is incorporated in the Works;
- (b) when the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.10 [Payment for Plant and Materials in Event of Suspension].

7.8 Royalties

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

- (a) natural Materials obtained from outside the Site, and
- (b) the disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

8. Commencement, Delays and Suspension

8.1 Commencement of Works

Except as otherwise specified in the Particular Conditions of Contract, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer's notification recording the agreement of both

Parties on such fulfilment and instructing to commence the Work is received by the Contractor:

- (a) signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country;
- (b) delivery to the Contractor of reasonable evidence of the Employer's financial arrangements (under Sub-Clause 2.4 [Employer's Financial Arrangements]);
- (c) except if otherwise specified in the Contract Data, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [Compliance with Laws] as required for the commencement of the Works
- (d) receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor.

If the said Engineer's instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause 16.2 [Termination by Contractor].

The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

8.2 Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

- (a) achieving the passing of the Tests on Completion, and
- (b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections].

8.3 Programme

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous

programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

- (a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,
- (b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),
- (c) the sequence and timing of inspections and tests specified in the Contract, and
- (d) a supporting report which includes:
 - (i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
 - (ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

The Contractor shall promptly give notice to the Engineer of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3 [Variation Procedure].

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a

revised programme to the Engineer in accordance with this Sub-Clause.

8.4 Extension of Time for Completion

The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [Taking Over of the Works and Sections] is or will be delayed by any of the following causes:

- (a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure]) or other substantial change in the quantity of an item of work included in the Contract,
- (b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,
- (c) exceptionally adverse climatic conditions,
- (d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
- (e) any delay, impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [Contractor's Claims]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5 Delays Caused by Authorities

If the following conditions apply, namely:

- (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,
- (b) these authorities delay or disrupt the Contractor's work, and
- (c) the delay or disruption was Unforeseeable,

then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [Extension of Time for Completion].

8.6 Rate of Progress

If, at any time:

- (a) actual progress is too slow to complete within the Time for Completion, and/or
- (b) progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [Programme],

other than as a result of a cause listed in Sub-Clause 8.4 [Extension of Time for Completion], then the Engineer may instruct the Contractor to submit, under Sub-Clause 8.3 [Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to notice under Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 below.

Additional costs of revised methods including acceleration measures, instructed by the Engineer to reduce delays resulting from causes listed under Sub-Clause 8.4 [Extension of Time for Completion] shall be paid by the Employer, without generating, however, any other additional payment benefit to the Contractor.

8.7 Delay Damages

If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall subject to notice under Sub-Clause 2.5 [Employer's Claims] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be paid for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Contract Data.

These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination by Employer] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8 Suspension of Work

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9, 8.10 and 8.11 shall not apply.

8.9 Consequences of Suspension

If the Contractor suffers delay and/or incurs Cost from complying with the Engineer's instructions under Sub-Clause 8.8 [Suspension of Work] and/or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [Suspension of Work].

8.10 Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/or Materials which have not been delivered to Site, if:

- (a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days, and
- (b) the Contractor has marked the Plant and/or Materials as the Employer's property in accordance with the Engineer's instructions.

8.11 Prolonged Suspension

If the suspension under Sub-Clause 8.8 [Suspension of Work] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [Variations and Adjustments] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [Termination by Contractor].

8.12 Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receiving from the Engineer an instruction to this effect under Clause 13 [Variations and Adjustments].

9. Tests on Completion

9.1 Contractor's Obligations

The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with subparagraph (d) of Sub-Clause 4.1 [Contractor's General Obligations].

The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor

shall submit a certified report of the results of these Tests to the Engineer.

9.2 Delayed Tests

If the Tests on Completion are being unduly delayed by the Employer, Sub-Clause 7.4 [Testing] (fifth paragraph) and/or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.

If the Tests on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may proceed with the Tests at the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

9.3 Retesting

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4 Failure to Pass Tests on Completion

If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [Retesting], the Engineer shall be entitled to:

- (a) order further repetition of Tests on Completion under Sub-Clause 9.3;
- (b) if the failure deprives the Employer of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [Failure to Remedy Defects]; or
- (c) issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this

failure is stated (or its method of calculation is defined) in the Contract, the Employer may require the reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations].

10. Employer's Taking Over

10.1 Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Employer when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [Time for Completion] and except as allowed in subparagraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.

The Engineer shall, within 28 days after receiving the Contractor's application:

- (a) issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or
- (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2 Taking Over of Parts of the Works

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works.

The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued a Taking-Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

- (a) the part which is used shall be deemed to have been taken over as from the date on which it is used,
- (b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and
- (c) if requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to payment of any such Cost plus profit, which shall be included in the Contract Price. After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this Cost and profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the

case may be) as a whole. The Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [Delay Damages], and shall not affect the maximum amount of these damages.

10.3 Interference with Tests on Completion

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11. Defects Liability

11.1 Completion of Outstanding Work and Remedying Defects

In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fair wear and tear excepted) by the expiry date of the relevant

Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

- (a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and
- (b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

11.2 Cost of Remedying Defects

All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:

- (a) any design for which the Contractor is responsible,
- (b) Plant, Materials or workmanship not being in accordance with the Contract, or
- (c) failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer, and Sub-Clause 13.3 [Variation Procedure] shall apply.

11.3 Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [Employer's Claims] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or by reason of damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.

If delivery and/or erection of Plant and/or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after

the Defects Notification Period for the Plant and/or Materials would otherwise have expired.

11.4 Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Employer may (at his option):

- (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage;
- (b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or
- (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5 Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6 Further Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any of the tests described in the Contract. The

requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [Cost of Remedying Defects], for the cost of the remedial work.

11.7 Right of Access

Until the Performance Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Employer's reasonable security restrictions.

11.8 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search plus profit shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price.

11.9 Performance Certificate

Performance of the Contractor's obligations shall not be considered to have been completed until the Engineer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

The Engineer shall issue the Performance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Performance Certificate shall be issued to the Employer.

Only the Performance Certificate shall be deemed to constitute acceptance of the Works.

11.10 Unfulfilled Obligations

After the Performance Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11 Clearance of Site

Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus

material, wreckage, rubbish and Temporary Works from the Site.

If all these items have not been removed within 28 days after receipt by the Contractor of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items. The Employer shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

12. Measurement and Evaluation

12.1 Works to be Measured

The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall show in each application under Sub-Clauses 14.3 [Application for Interim Payment Certificates], 14.10 [Statement on Completion] and 14.11 [Application for Final Payment Certificate] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.

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

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

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

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

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

notice to the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them and certify the payment of the undisputed part. If the Contractor does not so give notice to the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2 Method of Measurement

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

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

12.3 Evaluation

Except as otherwise stated in the Contract, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the Contract Price by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item.

For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contract or, if there is no such item, specified for similar work.

Any item of work included in the Bill of Quantities for which no rate or price was specified shall be considered as included in other rates and prices in the Bill of Quantities and will not be paid for separately.

However, a new rate or price shall be appropriate for an item of work if:

- (a)
 - (i) the measured quantity of the item is changed by more than 25% from the quantity of this item in the Bill of Quantities or other Schedule,
 - (ii) this change in quantity multiplied by such specified rate for this item exceeds 0.25% of the Accepted Contract Amount,

- (iii) this change in quantity directly changes the Cost per unit quantity of this item by more than 1%, and
- (iv) this item is not specified in the Contract as a “fixed rate item”;

or

(b)

- (i) the work is instructed under Clause 13 [Variations and Adjustments],
- (ii) no rate or price is specified in the Contract for this item, and
- (iii) no specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract.

Each new rate or price shall be derived from any relevant rates or prices in the Contract, with reasonable adjustments to take account of the matters described in sub-paragraph (a) and/or (b), as applicable. If no rates or prices are relevant for the derivation of a new rate or price, it shall be derived from the reasonable Cost of executing the work, together with profit, taking account of any other relevant matters.

Until such time as an appropriate rate or price is agreed or determined, the Engineer shall determine a provisional rate or price for the purposes of Interim Payment Certificates as soon as the concerned work commences.

12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

- (a) the Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount;
- (b) the omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and
- (c) this cost is not deemed to be included in the evaluation of any substituted work;

then the Contractor shall give notice to the Engineer accordingly, with supporting particulars. Upon receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this cost, which shall be included in the Contract Price.

13. Variations and Adjustments

13.1 Right to Vary

Variations may be initiated by the Engineer at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, or (ii) such Variation triggers a substantial change in the sequence or progress of the Works. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Each Variation may include:

- (a) changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation),
- (b) changes to the quality and other characteristics of any item of work,
- (c) changes to the levels, positions and/or dimensions of any part of the Works,
- (d) omission of any work unless it is to be carried out by others,
- (e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or
- (f) changes to the sequence or timing of the execution of the Works.

The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or approves a Variation.

13.2 Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i)

accelerate completion, (ii) reduce the cost to the Employer of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [Variation Procedure].

If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

- (a) the Contractor shall design this part,
- (b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and
- (c) if this change results in a reduction in the contract value of this part, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
 - (i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost], and
 - (ii) the reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

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

13.3 Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

- (a) a description of the proposed work to be performed and a programme for its execution,

- (b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and
- (c) the Contractor's proposal for evaluation of the Variation.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [Value Engineering] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

Each Variation shall be evaluated in accordance with Clause 12 [Measurement and Evaluation], unless the Engineer instructs or approves otherwise in accordance with this Clause.

13.4 Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.5 Provisional Sums

Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct:

- (a) work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [Variation Procedure]; and/or
- (b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]) or otherwise; and for which there shall be included in the Contract Price:
 - (i) the actual amounts paid (or due to be paid) by the Contractor, and

- (ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Contract Data shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

13.6 Daywork

For work of a minor or incidental nature, the Engineer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

- (a) the names, occupations and time of Contractor's Personnel,
- (b) the identification, type and time of Contractor's Equipment and Temporary Works, and
- (c) the quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates].

13.7 Adjustments for Changes in Legislation

The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws,

made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [Adjustments for Changes in Cost].

13.8 Adjustments for Changes in Cost

In this Sub-Clause, "table of adjustment data" means the completed table of adjustment data for local and foreign currencies included in the Schedules. If there is no such table of adjustment data, this Sub-Clause shall not apply.

If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labour, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied

to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$P_n = a + b L_n / L_o + c E_n / E_o + d M_n / M_o + \dots$ where:

“ P_n ” is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period “ n ”, this period being a month unless otherwise stated in the Contract Data ;

“ a ” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments;

“ b ”, “ c ”, “ d ”, ... are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be indicative of resources such as labour, equipment and materials;

“ L_n ”, “ E_n ”, “ M_n ”, ... are the current cost indices or reference prices for period “ n ”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 49 days prior to the last day of the period (to which the particular Payment Certificate relates); and

“ L_o ”, “ E_o ”, “ M_o ”, ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

In cases where the “currency of index” is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.

Until such time as each current cost index is available, the Engineer shall determine a provisional index for the issue of

Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.

If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price, whichever is more favourable to the Employer.

The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

14. Contract Price and Payment

14.1 The Contract Price

Unless otherwise stated in the Particular Conditions:

- (a) the Contract Price shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustments in accordance with the Contract;
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation];
- (c) any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:
 - (i) of the Works which the Contractor is required to execute, or
 - (ii) for the purposes of Clause 12 [Measurement and Evaluation]; and
- (d) the Contractor shall submit to the Engineer, within 28 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Engineer may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.

Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of

executing the Contract shall be exempt from the payment of import duties and taxes upon importation.

14.2 Advance Payment

The Employer shall make an advance payment, as an interest-free loan for mobilisation and cash flow support, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the Contract Data.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Contract Data, this Sub-Clause shall not apply.

The Engineer shall deliver to the Employer and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [Application for Interim Payment Certificates]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by a reputable bank or financial institution selected by the Contractor and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

Unless stated otherwise in the Contract Data, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Engineer in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates], as follows:

- (a) deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention)

exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and

- (b) deductions shall be made at the amortisation rate stated in the Contract Data of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Employer], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [Termination by Employer], except for Sub-Clause 15.5 [Employer's Entitlement to Termination for Convenience], payable by the Contractor to the Employer.

14.3 Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer after the end of each month, in a form approved by the Engineer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the report on the progress during this month in accordance with Sub-Clause 4.21 [Progress Reports].

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- (a) the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);
- (b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost];
- (c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in the

Contract Data to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Contract Data;

- (d) any amounts to be added for the advance payment and (if more than one instalment) and to be deducted for its repayments in accordance with Sub-Clause 14.2 [Advance Payment];
- (e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [Plant and Materials intended for the Works];
- (f) any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and
- (g) the deduction of amounts certified in all previous Payment Certificates.

14.4 Schedule of Payments

If the Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

- (a) the instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of subparagraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates];;
- (b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and
- (c) if these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less or more than that on which this schedule of payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine revised instalments, which shall take account of the extent to which progress is less or more than that on which the instalments were previously based.

If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at

quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

**14.5 Plant and
Materials intended
for the Works**

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates].

If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

- (a) the Contractor has:
 - (i) kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and
 - (ii) submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

and either:

- (b) the relevant Plant and Materials:
 - (i) are those listed in the Schedules for payment when shipped,
 - (ii) have been shipped to the Country, en route to the Site, in accordance with the Contract; and
 - (iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [Advance Payment] and shall be valid until the Plant and

Materials are properly stored on Site and protected against loss, damage or deterioration;

or

- (c) the relevant Plant and Materials:
 - (i) are those listed in the Schedules for payment when delivered to the Site, and
 - (ii) have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

The additional amount to be certified shall be the equivalent of eighty percent (80%) of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6 Issue of Interim Payment Certificates

No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, deliver to the Employer and to the Contractor an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer on the Statement if any.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Contract Data. In this event, the Engineer shall give notice to the Contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason, although:

- (a) if any thing supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
- (b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Engineer may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

14.7 Payment

The Employer shall pay to the Contractor:

- (a) the first instalment of the advance payment within 42 days after issuing the Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub-Clause 14.2 [Advance Payment], whichever is later;
- (b) the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents; or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and
- (c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate; or, at a time when the Bank's loan or credit (from which part of the payments to the Contractor is being made) is suspended, the undisputed amount shown in the Final Statement within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2 [Termination by Contractor].

Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

14.8 Delayed Payment

If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [Payment], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [Payment], irrespective (in the case of its sub-paragraph (b)) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, or if not available, the interbank offered rate, and shall be paid in such currency.

The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

14.9 Payment of Retention Money

When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

Promptly after the latest of the expiry dates of the Defects Notification Periods, the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

However, if any work remains to be executed under Clause 11 [Defects Liability], the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost].

Unless otherwise stated in the Particular Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security in Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release under the second paragraph of this Sub-Clause. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.

If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under it when the Taking-Over Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.

14.10 Statement at Completion

Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates], showing:

- (a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,

- (b) any further sums which the Contractor considers to be due, and
- (c) an estimate of any other amounts which the Contractor considers will become due to him under the Contract. Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates].

14.11 Application for Final Payment Certificate

Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer:

- (a) the value of all work done in accordance with the Contract, and
- (b) any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require within 28 days from receipt of said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the “Final Statement”.

However if, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [Obtaining Dispute Board’s Decision] or Sub-Clause 20.5 [Amicable Settlement], the Contractor shall then prepare and submit to the Employer (with a copy to the Engineer) a Final Statement.

14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the

outstanding balance of this total, in which event the discharge shall be effective on such date.

14.13 Issue of Final Payment Certificate

Within 28 days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall deliver, to the Employer and to the Contractor, the Final Payment Certificate which shall state:

- (a) the amount which he fairly determines is finally due, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

14.14 Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

- (a) in the Final Statement and also
- (b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [Statement at Completion].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

14.15 Currencies of Payment

The Contract Price shall be paid in the currency or currencies named in the Schedule of Payment Currencies. If more than one currency is so named, payments shall be made as follows:

- (a) if the Accepted Contract Amount was expressed in Local Currency only:

- (i) the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Schedule of Payment Currencies, except as otherwise agreed by both Parties;
- (ii) payments and deductions under Sub-Clause 13.5 [Provisional Sums] and Sub-Clause 13.7 [Adjustments for Changes in Legislation] shall be made in the applicable currencies and proportions; and
- (iii) other payments and deductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [Application for Interim Payment Certificates] shall be made in the currencies and proportions specified in sub-paragraph (a)(i) above;
- (b) payment of the damages specified in the Contract Data, shall be made in the currencies and proportions specified in the Schedule of Payment Currencies;
- (c) other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed by both Parties;
- (d) if any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
- (e) if no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and determined by the central bank of the Country.

15. Termination by Employer

15.1 Notice to Correct

If the Contractor fails to carry out any obligation under the Contract, the Engineer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

15.2 Termination by Employer

The Employer shall be entitled to terminate the Contract if the Contractor:

- (a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 [Notice to Correct],
- (b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
- (c) without reasonable excuse fails:
 - (i) to proceed with the Works in accordance with Clause 8 [Commencement, Delays and Suspension], or
 - (ii) to comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 [Remedial Work], within 28 days after receiving it,
- (d) subcontracts the whole of the Works or assigns the Contract without the required agreement,
- (e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
- (f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:
 - (i) for doing or forbearing to do any action in relation to the Contract, or
 - (ii) for showing or forbearing to show favour or disfavour to any person in relation to the Contract,

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

In any of these events or circumstances, the Employer may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in

the case of sub-paragraph (e) or (f), the Employer may by notice terminate the Contract immediately.

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

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

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

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

15.3 Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Employer may:

- (a) proceed in accordance with Sub-Clause 2.5 [Employer's Claims],
- (b) withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established, and/or

- (c) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [Valuation at Date of Termination]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

**15.5 Employer's
Entitlement to
Termination for
Convenience**

The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor].

After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and shall be paid in accordance with Sub-Clause 16.4 [Payment on Termination].

**15.6 Corrupt or
Fraudulent
Practices**

If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 15.2 [Termination by Employer].

Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent or coercive practice during the execution of the work then that employee shall be removed in accordance with Sub-Clause 6.9 [Contractor's Personnel].

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;³⁵

- (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;³⁶
- (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;³⁷
- (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;³⁸
- (v) “obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
 - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 1.15 [Inspections and Audits by the Bank].

16. Suspension and Termination by Contractor

³⁵ “Another party” refers to a public official acting in relation to the procurement process or contract execution]. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

16.1 Contractor's Entitlement to Suspend Work

If the Engineer fails to certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates] or the Employer fails to comply with Sub-Clause 2.4 [Employer's Financial Arrangements] or Sub-Clause 14.7 [Payment], the Contractor may, after giving not less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.

Notwithstanding the above, if the Bank has suspended disbursements under the loan or credit from which payments to the Contractor are being made, in whole or in part, for the execution of the Works, and no alternative funds are available as provided for in Sub-Clause 2.4 [Employer's Financial Arrangements], the Contractor may by notice suspend work or reduce the rate of work at any time, but not less than 7 days after the Borrower having received the suspension notification from the Bank.

The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [Delayed Payment] and to termination under Sub-Clause 16.2 [Termination by Contractor].

If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

If the Contractor suffers delay and/or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

³⁶ "Party" refers to a public official; the terms "benefit" and "obligation" relate to the procurement process or contract execution; and the "act or omission" is intended to influence the procurement process or contract execution.

³⁷ "Parties" refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

³⁸ "Party" refers to a participant in the procurement process or contract execution.

- (b) payment of any such Cost plus profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

16.2 Termination by Contractor

The Contractor shall be entitled to terminate the Contract if:

- (a) the Contractor does not receive the reasonable evidence within 42 days after giving notice under Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work] in respect of a failure to comply with Sub-Clause 2.4 [Employer's Financial Arrangements],
- (b) the Engineer fails, within 56 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
- (c) the Contractor does not receive the amount due under an Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7 [Payment] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Employer's Claims]),
- (d) the Employer substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract,
- (e) the Employer fails to comply with Sub-Clause 1.6 [Contract Agreement] or Sub-Clause 1.7 [Assignment],
- (f) a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [Prolonged Suspension], or
- (g) the Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.
- (h) the Contractor does not receive the Engineer's instruction recording the agreement of both Parties on

the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [Commencement of Works].

In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

In the event the Bank suspends the loan or credit from which part or whole of the payments to the Contractor are being made, if the Contractor has not received the sums due to him upon expiration of the 14 days referred to in Sub-Clause 14.7 [Payment] for payments under Interim Payment Certificates, the Contractor may, without prejudice to the Contractor's entitlement to financing charges under Sub-Clause 14.8 [Delayed Payment], take one of the following actions, namely (i) suspend work or reduce the rate of work under Sub-Clause 16.1 above, or (ii) terminate the Contract by giving notice to the Employer, with a copy to the Engineer, such termination to take effect 14 days after the giving of the notice.

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

16.3 Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [Employer's Entitlement to Termination for Convenience], Sub-Clause 16.2 [Termination by Contractor] or Sub-Clause 19.6 [Optional Termination, Payment and Release] has taken effect, the Contractor shall promptly:

- (a) cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works,
- (b) hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and
- (c) remove all other Goods from the Site, except as necessary for safety, and leave the Site.

16.4 Payment on Termination

After a notice of termination under Sub-Clause 16.2 [Termination by Contractor] has taken effect, the Employer shall promptly:

- (a) return the Performance Security to the Contractor,
- (b) pay the Contractor in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release], and
- (c) pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

17. Risk and Responsibility

17.1 Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

- (a) bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and
- (b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in subparagraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property].

17.2 Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [Taking Over of the Works and Sections]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Employer.

After responsibility has accordingly passed to the Employer, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub-Clause 17.3 [Employer's Risks], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3 Employer's Risks

The risks referred to in Sub-Clause 17.4 [Consequences of Employer's Risks] below, insofar as they directly affect the execution of the Works in the Country, are:

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war, within the Country,
- (c) riot, commotion or disorder within the Country by persons other than the Contractor's Personnel,
- (d) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, within the Country,

except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,

- (e) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- (f) use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract,
- (g) design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, and
- (h) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventive precautions.

17.4 Consequences of Employer's Risks

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [Employer's Risks], Cost plus profit shall be payable.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

17.5 Intellectual and Industrial Property Rights

In this Sub-Clause, "infringement" means an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works;

and “claim” means a claim (or proceedings pursuing a claim) alleging an infringement.

Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

- (a) an unavoidable result of the Contractor’s compliance with the Contract, or
- (b) a result of any Works being used by the Employer:
 - (i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
 - (ii) in conjunction with any thing not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.6 Limitation of Liability

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [Delay Damages]; Sub-Clause 11.2 [Cost of Remedying Defects]; Sub-Clause 15.4 [Payment after Termination]; Sub-Clause

16.4 [Payment on Termination]; Sub-Clause 17.1 [Indemnities]; Sub-Clause 17.4(b) [Consequences of Employer's Risks] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Materials], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

17.7 Use of Employer's Accommodation/Facilities

The Contractor shall take full responsibility for the care of the Employer provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

18. Insurance

18.1 General Requirements for Insurances

In this Clause, "insuring Party" means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the

Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant insuring Party shall, within the respective periods stated in the Contract Data (calculated from the Commencement Date), submit to the other Party:

- (a) evidence that the insurances described in this Clause have been effected, and
- (b) copies of the policies for the insurances described in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 18.3 [Insurance against Injury to Persons and Damage to Property].

When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party.

If an insurer makes (or attempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Employer in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Employer's Claims] or Sub-Clause 20.1 [Contractor's Claims], as applicable.

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.

18.2 Insurance for Works and Contractor's Equipment

The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for

loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]).

The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Particular Conditions, insurances under this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,
- (c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Employer's Risks],
- (d) shall also cover, to the extent specifically required in the bidding documents of the Contract, loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the risks listed in subparagraphs (c), (g) and (h) of Sub-Clause 17.3 [Employer's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Contract Data (if an amount is not so stated, this sub-paragraph (d) shall not apply), and
- (e) may however exclude loss of, damage to, and reinstatement of:
 - (i) a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in subparagraph (ii) below),

- (ii) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,
- (iii) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and
- (iv) Goods while they are not in the Country, subject to Sub-Clause 14.5 [Plant and Materials intended for the Works].

If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [Employer's Claims] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [General Requirements for Insurances].

18.3 Insurance against Injury to Persons and Damage to Property

The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the amount stated in the Contract Data, with no limit on the number of occurrences. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

Unless otherwise stated in the Particular Conditions, the insurances specified in this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,

- (b) shall be in the joint names of the Parties,
- (c) shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
- (d) may however exclude liability to the extent that it arises from:
 - (i) the Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,
 - (ii) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects, and
 - (iii) a cause listed in Sub-Clause 17.3 [Employer's Risks], except to the extent that cover is available at commercially reasonable terms.

18.4 Insurance for Contractor's Personnel

The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The insurance shall cover the Employer and the Engineer against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19. Force Majeure

19.1 Definition of Force Majeure

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

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

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

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

19.2 Notice of Force Majeure

If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

- 19.3 Duty to Minimise Delay** Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.
- A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.
- 19.4 Consequences of Force Majeure** If the Contractor is prevented from performing his substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
 - (b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [Definition of Force Majeure] and, in sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment].
- After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 19.5 Force Majeure Affecting Subcontractor** If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.
- 19.6 Optional Termination, Payment and Release** If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the

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

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

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

19.7 Release from Performance

Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance:

- (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
- (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and

Release] if the Contract had been terminated under Sub-Clause 19.6.

20. Claims, Disputes and Arbitration

20.1 Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;

- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within the above defined time period.

Within the above defined period of 42 days, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

Each Payment Certificate shall include such additional payment for any claim as has been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

If the Engineer does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Engineer and any of the Parties may refer to the Dispute Board in accordance with Sub-Clause 20.4 [Obtaining Dispute Board's Decision].

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the

failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

20.2 Appointment of the Dispute Board

Disputes shall be referred to a DB for decision in accordance with Sub-Clause 20.4 [Obtaining Dispute Board's Decision]. The Parties shall appoint a DB by the date stated in the Contract Data.

The DB shall comprise, as stated in the Contract Data, either one or three suitably qualified persons ("the members"), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of construction involved in the Works and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the DB shall comprise three persons.

If the Parties have not jointly appointed the DB 21 days before the date stated in the Contract Data and the DB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members has been agreed by the Parties and is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DB.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix A to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

If at any time the Parties so agree, they may jointly refer a matter to the DB for it to give its opinion. Neither Party shall consult the DB on any matter without the agreement of the other Party.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DB (including each member) shall expire when the discharge referred to in Sub-Clause 14.12 [Discharge] shall have become effective.

**20.3 Failure to Agree
on the
Composition of
the Dispute Board**

If any of the following conditions apply, namely:

- (a) the Parties fail to agree upon the appointment of the sole member of the DB by the date stated in the first paragraph of Sub-Clause 20.2, [Appointment of the Dispute Board],
- (b) either Party fails to nominate a member (for approval by the other Party), or fails to approve a member nominated by the other Party, of a DB of three persons by such date,
- (c) the Parties fail to agree upon the appointment of the third member (to act as chairman) of the DB by such date, or
- (d) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment,

then the appointing entity or official named in the Contract Data shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.

**20.4 Obtaining Dispute
Board's Decision**

If a dispute (of any kind whatsoever) arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, either Party may refer the dispute in writing to the DB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

Both Parties shall promptly make available to the DB all such additional information, further access to the Site, and appropriate facilities, as the DB may require for the purposes of making a decision on such dispute. The DB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the DB and approved by both Parties, the DB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DB's decision, then either Party may, within 28 days after receiving the decision, give a Notice of Dissatisfaction to the other Party indicating its dissatisfaction and intention to commence arbitration. If the DB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give a Notice of Dissatisfaction to the other Party.

In either event, this Notice of Dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in Sub-Clause 20.7 [Failure to Comply with Dispute Board's Decision] and Sub-Clause 20.8 [Expiry of Dispute Board's Appointment], neither Party shall be entitled to commence arbitration of a dispute unless a Notice of Dissatisfaction has been given in accordance with this Sub-Clause.

If the DB has given its decision as to a matter in dispute to both Parties, and no Notice of Dissatisfaction has been given by either Party within 28 days after it received the DB's decision, then the decision shall become final and binding upon both Parties.

20.5 Amicable Settlement

Where a Notice of Dissatisfaction has been given under Sub-Clause 20.4 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, the Party giving

a Notice of Dissatisfaction in accordance with Sub-Clause 20.4 above should move to commence arbitration after the fifty-sixth day from the day on which a Notice of Dissatisfaction was given, even if no attempt at an amicable settlement has been made.

20.6 Arbitration

Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.5 above and in respect of which the DB's decision (if any) has not become final and binding shall be finally settled by arbitration. Arbitration shall be conducted as follows:

- (a) if the contract is with foreign contractors,
 - (i) for contracts financed by all participating Banks except under sub-paragraph (a) (2) below: international arbitration (1) with proceedings administered by the arbitration institution designated in the Contract Data, and conducted under the rules of arbitration of such institution; or, if so specified in the Contract Data, (2) international arbitration in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or (3) if neither an arbitration institution nor UNCITRAL arbitration rules are specified in the Contract Data, with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules
- (b) if the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country.

The place of arbitration shall be the neutral location specified in the Contract Data; and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [Law and Language].

The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and

giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

**20.7 Failure to Comply
with Dispute
Board's Decision**

In the event that a Party fails to comply with a final and binding DB decision, then the other Party may, without prejudice to any other rights it may have, refer the failure itself to arbitration under Sub-Clause 20.6 [Arbitration]. Sub-Clause 20.4 [Obtaining Dispute Board's Decision] and Sub-Clause 20.5 [Amicable Settlement] shall not apply to this reference.

**20.8 Expiry of Dispute
Board's
Appointment**

If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works and there is no DB in place, whether by reason of the expiry of the DB's appointment or otherwise:

- (a) Sub-Clause 20.4 [Obtaining Dispute Board's Decision] and Sub-Clause 20.5 [Amicable Settlement] shall not apply, and
- (b) the dispute may be referred directly to arbitration under Sub-Clause 20.6 [Arbitration].

APPENDIX A

A General Conditions of Dispute Board Agreement

1. Definitions

Each "Dispute Board Agreement" is a tripartite agreement by and between:

- (a) the "Employer";
- (b) the "Contractor"; and
- (c) the "Member" who is defined in the Dispute Board Agreement as being:
 - (i) the sole member of the "DB" and, where this is the case, all references to the "Other Members" do not apply, or
 - (ii) one of the three persons who are jointly called the "DB" (or "Dispute Board") and, where this is the case, the other two persons are called the "Other Members".

The Employer and the Contractor have entered (or intend to enter) into a contract, which is called the "Contract" and is defined in the Dispute Board Agreement, which incorporates this Appendix. In the Dispute Board Agreement, words and expressions which are not otherwise defined shall have the meanings assigned to them in the Contract.

2. General Provisions

Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- (a) the Commencement Date defined in the Contract,
- (b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement, or
- (c) when the Employer, the Contractor and each of the Other Members (if any) have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days' notice of resignation to the Employer and to the Contractor, and the Dispute Board Agreement shall terminate upon the expiry of this period.

3. Warranties

The Member warrants and agrees that he/she is and shall be impartial and independent of the Employer, the Contractor and the Engineer. The Member shall promptly disclose, to each of them and to the Other Members (if any), any fact or circumstance which

might appear inconsistent with his/her warranty and agreement of impartiality and independence.

When appointing the Member, the Employer and the Contractor relied upon the Member's representations that he/she is:

- (a) experienced in the work which the Contractor is to carry out under the Contract,
- (b) experienced in the interpretation of contract documentation, and
- (c) fluent in the language for communications defined in the Contract.

4. General Obligations of the Member

The Member shall:

- (a) have no interest financial or otherwise in the Employer, the Contractor or Engineer, nor any financial interest in the Contract except for payment under the Dispute Board Agreement;
- (b) not previously have been employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except in such circumstances as were disclosed in writing to the Employer and the Contractor before they signed the Dispute Board Agreement;
- (c) have disclosed in writing to the Employer, the Contractor and the Other Members (if any), before entering into the Dispute Board Agreement and to his/her best knowledge and recollection, any professional or personal relationships with any director, officer or employee of the Employer, the Contractor or the Engineer, and any previous involvement in the overall project of which the Contract forms part;
- (d) not, for the duration of the Dispute Board Agreement, be employed as a consultant or otherwise by the Employer, the Contractor or the Engineer, except as may be agreed in writing by the Employer, the Contractor and the Other Members (if any);
- (e) comply with the annexed procedural rules and with Sub-Clause 20.4 of the Conditions of Contract;
- (f) not give advice to the Employer, the Contractor, the Employer's Personnel or the Contractor's Personnel concerning the conduct of the Contract, other than in accordance with the annexed procedural rules;

- (g) not while a Member enter into discussions or make any agreement with the Employer, the Contractor or the Engineer regarding employment by any of them, whether as a consultant or otherwise, after ceasing to act under the Dispute Board Agreement;
- (h) ensure his/her availability for all site visits and hearings as are necessary;
- (i) become conversant with the Contract and with the progress of the Works (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;
- (j) treat the details of the Contract and all the DB's activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and
- (k) be available to give advice and opinions, on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).

**5. General
Obligations of the
Employer and the
Contractor**

The Employer, the Contractor, the Employer's Personnel and the Contractor's Personnel shall not request advice from or consultation with the Member regarding the Contract, otherwise than in the normal course of the DB's activities under the Contract and the Dispute Board Agreement. The Employer and the Contractor shall be responsible for compliance with this provision, by the Employer's Personnel and the Contractor's Personnel respectively.

The Employer and the Contractor undertake to each other and to the Member that the Member shall not, except as otherwise agreed in writing by the Employer, the Contractor, the Member and the Other Members (if any):

- (a) be appointed as an arbitrator in any arbitration under the Contract;
- (b) be called as a witness to give evidence concerning any dispute before arbitrator(s) appointed for any arbitration under the Contract; or

- (c) be liable for any claims for anything done or omitted in the discharge or purported discharge of the Member's functions, unless the act or omission is shown to have been in bad faith.

The Employer and the Contractor hereby jointly and severally indemnify and hold the Member harmless against and from claims from which he is relieved from liability under the preceding paragraph.

Whenever the Employer or the Contractor refers a dispute to the DB under Sub-Clause 20.4 of the Conditions of Contract, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.

6. Payment

The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

- (a) a retainer fee per calendar month, which shall be considered as payment in full for:
 - (i) being available on 28 days' notice for all site visits and hearings;
 - (ii) becoming and remaining conversant with all project developments and maintaining relevant files;
 - (iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and
 - (iv) all services performed hereunder except those referred to in sub-paragraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the whole of the Works.

With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

- (b) a daily fee which shall be considered as payment in full for:

- (i) each day or part of a day up to a maximum of two days' travel time in each direction for the journey between the Member's home and the Site, or another location of a meeting with the Other Members (if any);
 - (ii) each working day on Site visits, hearings or preparing decisions; and
 - (iii) each day spent reading submissions in preparation for a hearing.
- (c) all reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, faxes and telexes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in sub-paragraph (b) of this Clause;
- (d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the Contract Data shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a Site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of one-half of the amounts of these invoices. The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of all sums paid in excess of one-half of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.

7. Termination

At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days' notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.

8. Default of the Member

If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

If the Member fails to comply with any of his obligations under Clause 4 (e) - (k) above, he shall not be entitled to any fees or expenses hereunder from the date and to the extent of the non-

compliance and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses already received by the Member, for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

9. Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.

PROCEDURAL RULES

Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the Site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.

The timing of and agenda for each Site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of Site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to endeavour to prevent potential problems or claims from becoming disputes.

Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be co-ordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each Site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.

The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

If any dispute is referred to the DB in accordance with Sub-Clause 20.4 of the Conditions of Contract, the DB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:

- (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
- (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.

The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.

Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.

The Employer and the Contractor empower the DB, among other things, to:

- (a) establish the procedure to be applied in deciding a dispute,
- (b) decide upon the DB's own jurisdiction, and as to the scope of any dispute referred to it,
- (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules,
- (d) take the initiative in ascertaining the facts and matters required for a decision,
- (e) make use of its own specialist knowledge, if any,
- (f) decide upon the payment of financing charges in accordance with the Contract,
- (g) decide upon any provisional relief such as interim or conservatory measures, and
- (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute.

The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:

- (a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
- (b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
- (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
 - (i) either the Employer or the Contractor does not agree that they do so, or
 - (ii) the absent Member is the chairman and he/she instructs the other Members not to make a decision.

*Metrics for regular reporting:***APPENDIX B****Environmental, Social, Health and Safety (ESHS)****Metrics for Progress Reports**

- a. *environmental incidents or non-compliances with contract requirements, including contamination, pollution or damage to ground or water supplies;*
- b. *health and safety incidents, accidents, injuries and all fatalities that require treatment;*
- c. *interactions with regulators: identify agency, dates, subjects, outcomes (report the negative if none);*
- d. *status of all permits and agreements:*
 - i. *work permits: number required, number received, actions taken for those not received;*
 - ii. *status of permits and consents:*
 - *list areas/facilities with permits required (quarries, asphalt & batch plants), dates of application, dates issued (actions to follow up if not issued), dates submitted to resident engineer (or equivalent), status of area (waiting for permits, working, abandoned without reclamation, decommissioning plan being implemented, etc.);*
 - *list areas with landowner agreements required (borrow and spoil areas, camp sites), dates of agreements, dates submitted to resident engineer (or equivalent);*
 - *identify major activities undertaken in each area in the reporting period and highlights of environmental and social protection (land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation);*
 - *for quarries: status of relocation and compensation (completed, or details of activities and current status in the reporting period).*
- e. *health and safety supervision:*
 - i. *safety officer: number days worked, number of full inspections & partial inspections, reports to construction/project management;*
 - ii. *number of workers, work hours, metric of PPE use (percentage of workers with full personal protection equipment (PPE), partial, etc.), worker violations observed (by type of violation, PPE or otherwise), warnings given, repeat warnings given, follow-up actions taken (if any);*

- f. worker accommodations:*
 - i. number of expats housed in accommodations, number of locals;
 - ii. date of last inspection, and highlights of inspection including status of accommodations' compliance with national and local law and good practice, including sanitation, space, etc.;
 - iii. actions taken to recommend/require improved conditions, or to improve conditions.
- g. HIV/AIDS: provider of health services, information and/or training, location of clinic, number of non-safety disease or illness treatments and diagnoses (no names to be provided);*
- h. gender (for expats and locals separately): number of female workers, percentage of workforce, gender issues raised and dealt with (cross-reference grievances or other sections as needed);*
- i. training:*
 - i. number of new workers, number receiving induction training, dates of induction training;
 - ii. number and dates of toolbox talks, number of workers receiving Occupational Health and Safety (OHS), environmental and social training;
 - iii. number and dates of HIV/AIDS sensitization and/or training, no. workers receiving training (in the reporting period and in the past); same questions for gender sensitization, flag person training.
 - iv. number and date of GBV /SEA sensitization and/or training, number of workers receiving training on code of conduct (in the reporting period and in the past), etc.
- j. environmental and social supervision:*
 - i. environmentalist: days worked, areas inspected and numbers of inspections of each (road section, work camp, accommodations, quarries, borrow areas, spoil areas, swamps, forest crossings, etc.), highlights of activities/findings (including violations of environmental and/or social best practices, actions taken), reports to environmental and/or social specialist/construction/site management;
 - ii. sociologist: days worked, number of partial and full site inspections (by area: road section, work camp, accommodations, quarries, borrow areas, spoil areas, clinic, HIV/AIDS center, community centers, etc.), highlights of activities (including violations of environmental and/or social requirements observed, actions taken), reports to environmental and/or social specialist/construction/site management; and

- iii. community liaison person(s): days worked (hours community center open), number of people met, highlights of activities (issues raised, etc.), reports to environmental and/or social specialist /construction/site management.
- k. *Grievances: list new grievances (e.g. allegations of GBV / SEA) received in the reporting period and unresolved past grievances by date received, complainant, how received, to whom referred to for action, resolution and date (if completed), data resolution reported to complainant, any required follow-up (Cross-reference other sections as needed):*
 - i. Worker grievances;
 - ii. Community grievances
- l. *Traffic and vehicles/equipment:*
 - i. traffic accidents involving project vehicles & equipment: provide date, location, damage, cause, follow-up;
 - ii. accidents involving non-project vehicles or property (also reported under immediate metrics): provide date, location, damage, cause, follow-up;
 - iii. overall condition of vehicles/equipment (subjective judgment by environmentalist); non-routine repairs and maintenance needed to improve safety and/or environmental performance (to control smoke, etc.).
- m. *Environmental mitigations and issues (what has been done):*
 - i. dust: number of working bowsters, number of waterings/day, number of complaints, warnings given by environmentalist, actions taken to resolve; highlights of quarry dust control (covers, sprays, operational status); % of rock/spoil lorries with covers, actions taken for uncovered vehicles;
 - ii. erosion control: controls implemented by location, status of water crossings, environmentalist inspections and results, actions taken to resolve issues, emergency repairs needed to control erosion/sedimentation;
 - iii. quarries, borrow areas, spoil areas, asphalt plants, batch plants: identify major activities undertaken in the reporting period at each, and highlights of environmental and social protection: land clearing, boundary marking, topsoil salvage, traffic management, decommissioning planning, decommissioning implementation;
 - iv. blasting: number of blasts (and locations), status of implementation of blasting plan (including notices, evacuations, etc.), incidents of off-site damage or complaints (cross-reference other sections as needed);
 - v. spill cleanups, if any: material spilled, location, amount, actions taken, material disposal (report all spills that result in water or soil contamination);

- vi. waste management: types and quantities generated and managed, including amount taken offsite (and by whom) or reused/recycled/disposed on-site;
 - vii. details of tree plantings and other mitigations required undertaken in the reporting period;
 - viii. details of water and swamp protection mitigations required undertaken in the reporting period.
- n. compliance:*
- i. compliance status for conditions of all relevant consents/permits, for the Work, including quarries, etc.): statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance;
 - ii. compliance status of C-ESMP/ESIP requirements: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance
 - iii. compliance status of GBV/SEA prevention and response action plan: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance
 - iv. compliance status of Health and Safety Management Plan re: statement of compliance or listing of issues and actions taken (or to be taken) to reach compliance
 - v. other unresolved issues from previous reporting periods related to environmental and social: continued violations, continued failure of equipment, continued lack of vehicle covers, spills not dealt with, continued compensation or blasting issues, etc. Cross-reference other sections as needed.

Section IX. Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

Part A - Contract Data

Conditions	Sub-Clause	Data
Employer's name and address	1.1.2.2 & 1.3	KENYA NATIONAL HIGHWAYS AUTHORITY(KeNHA) P.O. BOX 49712 - 00100 <u>NAIROBI</u>
Engineer's name and address	1.1.2.4 & 1.3	The Engineer is :- Supervising consultant – name to be notified The Address of the Engineer is :- Supervising consultant – address to be notified
Bank's name	1.1.2.11	International Development Association (IDA)
Borrower's name	1.1.2.12	Government of the Republic of Kenya
Time for Completion	1.1.3.3	30 months
Defects Notification Period	1.1.3.7	365 days.
Sections	1.1.5.6	Not Applicable
Electronic transmission systems	1.3	Not Applicable
Governing Law	1.4	Laws of the Republic of Kenya
Ruling language	1.4	English.
Language for communications	1.4	English.
Time for the Parties entering into a Contract Agreement	1.6	Not Applicable
Inspections and Audit by the Bank	1.15	This clause shall be amended as follows: The Contractor shall permit, and shall cause its agents (whether declared or not), sub-contractors, sub-consultants, service providers, or suppliers and any personnel thereof, to permit, the Bank and/or persons appointed by the Bank to inspect the Site and all accounts and records relating to the performance of the Contract and the

Conditions	Sub-Clause	Data
		submission of the bid, and to have such accounts and records audited by auditors appointed by the Bank if requested by the Bank. The Contractor's attention is drawn to Sub-Clause 15.6 [Corrupt or Fraudulent Practices] which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under Sub-Clause 1.15 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures.
Time for access to the Site	2.1	No later than 56 days after the Commencement Day,
Engineer's Duties and Authority	3.1(b)(ii)	Variations resulting in an increase of the Accepted Contract Amount in excess of 0.2% shall require approval of the Employer.
Performance Security	4.2	The performance security will be in the form of an unconditional demand guarantee issued by a bank in the amount of Ten (10) % percent of the Accepted Contract Amount and in the same currency (ies) of the Accepted Contract Amount.
Environmental, Social, Health and Safety (ESHS) Performance Security	4.2	The ESHS Performance Security will be in the form of a " <i>demand guarantee</i> " in the amount(s) of two (2) % percent of the Accepted Contract Amount and in the same currency (ies) of the Accepted Contract Amount.
Normal working hours	6.5	45 hours a week as follows <ul style="list-style-type: none"> - Monday to Friday: 8am – 5pm excluding 1pm to 2pm - Saturday: 8am – 1pm Contractor may work more than 45 hours a week subject to prior approval of the Engineer and with payment of overtime to staff in accordance with local labour regulations.

Conditions	Sub-Clause	Data
Delay damages for the Works	8.7 & 14.15(b)	0.03% of the Accepted Contract Amount per day or part thereof.
Maximum amount of delay damages	8.7	Ten (10) % of the Accepted Contract Amount.
Provisional Sums	13.5.(b)(ii)	Fifteen (15)%
Adjustments for Changes in Cost	13.8	Coefficients and cost indices shall be in accordance with Appendix to Bid, Schedule of adjustment Data
Total advance payment	14.2	15% Percent of the Accepted Contract Amount payable in the currencies and proportions in which the Accepted Contract Amount is payable
Repayment amortization rate of advance payment	14.2(b)	30% of the amount of monthly interim payment certificates, and completely repaid prior to the time when 80 percent (80%) of the accepted Contract Amount less Provisional Sums has been certified for payment.
Percentage of Retention	14.3	10 % of interim payment certificates.
Limit of Retention Money	14.3	5% of the Accepted Contract Amount
Plant and Materials	14.5(b)(i)	N/A
	14.5(c)(i)	<ul style="list-style-type: none"> • Straight run bitumen • Cut back bitumen • Bitumen emulsion • Cement • Reinforcing steel • Structural steel • Road furniture
Minimum Amount of Interim Payment Certificates	14.6	One (1) % of the Accepted Contract Amount.
Publishing source of commercial interest rates for financial charges in case of delayed payment	14.8	Central Bank of Kenya
Maximum total liability of the Contractor to the Employer	17.6	The Accepted Contract Amount

Conditions	Sub-Clause	Data
Periods for submission of insurance: a. evidence of insurance. b. relevant policies	18.1	14 days 28 days
Maximum amount of deductibles for insurance of the Employer's risks	18.2(d)	Not applicable
Minimum amount of third party insurance	18.3	Limited to Kshs. 8 (Eight) million for each occurrence, with unlimited number of occurrences
Date by which the DB shall be appointed	20.2	28 days after the Commencement date
The DB shall be comprised of	20.2	Three members
List of potential DB sole members	20.2	FIDIC President's list of adjudicators, www.fidic.org/
Appointment (if not agreed) to be made by	20.3	Permanent Court of Arbitration, Hague, Netherlands
Rules of arbitration	20.6(a)	UNCITRAL Rules. The arbitration tribunal shall comprise three members to be appointed in similar manner as prescribed for the members of the DB under sub clause 20.2.
Place of arbitration	20.6(b)	To be agreed between parties prior to contract signature
Language of arbitration	20.6(c)	English

Part B - Specific Provisions

Sub-Clause 1.1.2.7 Contractor's Personnel

Key Personnel

The following is added at the end of the sub-clause:

“Contractor's Personnel includes Key Personnel as named in Part A - Contract Data.”

Sub-Clause 1.1.6.11 Other Definitions

The following is added as Sub-Clause 1.1.6.11

“ESHS” means environmental, social (including sexual exploitation and abuse (SEA) and gender based violence (GBV)), health and safety.

Sub-Clause 3.1 Engineer's Duties and Authority

The following additional provisions shall also apply:

The Engineer shall obtain the specific approval of the Employer before taking action under the following sub-clauses of these Conditions:

Add:

- (e) consenting to subcontracting of any part of the Works under Sub-Clause 4.4
- (f) determining an extension of time under Sub-Clause 8.4
- (g) issuing a Taking Over Certificate under Sub-Clauses 10.1 and 10.2

Sub-Clause 4.1 Contractor's General Obligations

Insert in the fifth paragraph after the words “*The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.*”

“Notwithstanding Sub-Clause 8.1, the Contractor shall not carry out any Works, including mobilization and/or pre-construction activities (e.g. limited clearance for haul roads, site accesses and work site establishment, geotechnical investigations or investigations to select ancillary features such as quarries and borrow pits), unless the Engineer is satisfied that appropriate measures are in place to address environmental, social, health and safety risks and impacts. At a minimum, the Contractor shall apply the Management Strategies and Implementation Plans and Code of Conduct,

submitted as part of the Bid and agreed as part of the Contract. The Contractor shall submit, on a continuing basis, for the Engineer's prior approval, such supplementary Management Strategies and Implementation Plans as are necessary to manage the ESHS risks and impacts of ongoing works. These Management Strategies and Implementation Plans collectively comprise the Contractor's Environmental and Social Management Plan (C-ESMP). The C-ESMP shall be approved prior to the commencement of construction activities (e.g. excavation, earth works, bridge and structure works, stream and road diversions, quarrying or extraction of materials, concrete batching and asphalt manufacture). The approved C-ESMP shall be reviewed, periodically (but not less than every six (6) months), and updated in a timely manner, as required, by the Contractor to ensure that it contains measures appropriate to the Works activities to be undertaken. The updated C-ESMP shall be subject to prior approval by the Engineer.

**Sub-Clause 4.2
Performance Security**

Replace sub-clause 4.2 in its entirety with the following:

“4.2 Performance Security and ESHS Performance Security

The Contractor shall obtain (at its cost) a Performance Security for proper performance and, if applicable, an Environmental, Social, Safety and Health (ESHS) Performance Security for compliance with the Contractor's ESHS obligations, in the amounts stated in the Contract Data and denominated in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Employer. If amounts are not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the Performance Security and, if applicable, an ESHS Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer. The ESHS Performance Security shall be issued by a reputable bank selected by the Contractor, and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data, or in another form approved by the Employer.

The Contractor shall ensure that the Performance Security and, if applicable, the ESHS Performance Security are valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security and, if applicable, ESHS Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate (which, if applicable, includes satisfactory performance of the ESHS obligations), by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security and, if applicable, the ESHS Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security and, if applicable, the ESHS Performance Security, except for amounts to which the Employer is entitled under the Contract.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security and, if applicable, the ESHS Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security and, if applicable, the ESHS Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation, or as a result of a Variation, amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Engineer's request promptly increase, or may decrease, as the case may be, the value of the Performance Security and, if applicable, the ESHS Performance Security in that currency by an equal percentage.”

In the following sub-clauses the term “Performance Security” is replaced with: “Performance Security and, if applicable, an Environmental, Social, Health and Safety (ESHS) Performance Security”:

- 2.1- Right of Access to the Site
- 14.2- Advance Payment
- 14.6- Issue of Interim Payment Certificate
- 14.7(a)- Payment
- 14.9- Payment of Retention money
- 14.12- Discharge
- 15.2(a)- Termination
- 15.5- Employer’s Entitlement to Termination for Convenience
- 16.4(a)- Payment on termination”

**Sub-Clause 4.21
Progress Reports**

Sub-Clause 4.21 (g) is replaced by the following:

“4.21 (g) the Environmental, Social, Health and Safety (ESHS) metrics set out in Appendix B”

At the end of, and as part of Sub-Clause 4.21 add a new paragraph as follows:

“The Contractor shall provide immediate notification to the Engineer of incidents in the following categories. Full details of such incidents shall be provided to the Engineer within the timeframe agreed with the Engineer.

- (a) confirmed or likely violation of any law or international agreement;
- (b) any fatality or serious (lost time) injury;
- (c) significant adverse effects or damage to private property (e.g. vehicle accident, damage from fly rock, working beyond the boundary)
- (d) major pollution of drinking water aquifer or damage or destruction of rare or endangered habitat (including protected areas) or species; or
- (e) any allegation of gender based violence (GBV), sexual exploitation or abuse, sexual harassment or sexual misbehavior, rape, sexual assault, child abuse, or defilement, or other violations involving children.

**Sub-Clause 6.9
Contractor's Personnel**

Key Personnel

Sub-Clauses 6.9 (d) is amended by inserting "or" at the end:

"6.9 (d).....; or"

Sub-Clauses 6.9 (e) is inserted as follows:

"6.9 (e) undertakes behavior which breaches the Code of Conduct (ESHS) (e.g. spreading communicable diseases, sexual harassment, gender based violence, (GBV), sexual exploitation or abuse, illicit activity or crime)."

After the sentence: *"If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person."* the following is added as a new paragraph:

"The Contractor's Personnel includes Key Personnel. If the Contractor intends to replace a Key Personnel, the Contractor shall, not less than 30 days before the intended date of replacement, give notice to the Engineer, the name, address, academic qualifications and relevant experience of the intended replacement Key Personnel. The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Key Personnel or appoint a replacement."

**Sub-Clause 13.3
Variation procedure**

Sub-Clause 13.3. (a) is replaced with the following:

"(a) a description of the proposed work to be performed, a programme for its execution and sufficient ESHS information to enable an evaluation of ESHS risks and impacts;"

**Sub-Clause 14.1
The Contract Price**

(e) Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall be temporarily exempt from the payment of import duties and taxes upon initial importation, provided the Contractor shall

post with the customs authorities at the port of entry an approved export bond or bank guarantee, valid until the Time for Completion plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment and spare parts, and callable in the event the Contractor's Equipment is not exported from the Country on completion of the Contract. A copy of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer upon the importation of individual items of Contractor's Equipment and spare parts. Upon export of individual items of Contractor's Equipment or spare parts, or upon the completion of the Contract, the Contractor shall prepare, for approval by the customs authorities, an assessment of the residual value of the Contractor's Equipment and spare part to be exported, based on the depreciation scale(s and other criteria used by the customs authorities for such purposes under the provisions of the applicable Laws. Import duties and taxes shall be due and payable to the customs authorities by the Contractor on (a) the difference between the initial imported value and the residual value of the Contractor's Equipment and spare parts to exported; and (b) on the initial imported value that Contractor's Equipment and spare parts remaining in the Country after completion of the Contract. Upon payment of such dues within 28 days of being invoiced, the bond or bank guarantee shall be reduced or released accordingly; otherwise the security shall be called in the full amount remaining.

Sub-Clause 14.6
Issue of Interim
Payment Certificates

The following is added to the third paragraph as (c):

- (a) if the Contractor was, or is, failing to perform any ESHS obligations or work under the Contract, the value of this work or obligation, as determined by the Engineer, may be withheld until the work or obligation has been performed, and/or the cost of rectification or replacement, as determined by the Engineer, may be withheld until rectification or replacement has been completed. Failure to perform includes, but is not limited to the following:
 - (i) failure to comply with any ESHS obligations or work described in the Works' Requirements which may include: working outside site

boundaries, excessive dust, failure to keep public roads in a safe usable condition, damage to offsite vegetation, pollution of water courses from oils or sedimentation, contamination of land e.g. from oils, human waste, damage to archeology or cultural heritage features, air pollution as a result of unauthorized and/or inefficient combustion;

- (ii) failure to regularly review C-ESMP and/or update it in a timely manner to address emerging ESHS issues, or anticipated risks or impacts;
- (iii) failure to implement the C-ESMP e.g. failure to provide required training or sensitization;
- (iv) failing to have appropriate consents/permits prior to undertaking Works or related activities;
- (v) failure to submit ESHS report/s (as described in Appendix B), or failure to submit such reports in a timely manner;
- (vi) failure to implement remediation as instructed by the Engineer within the specified timeframe (e.g. remediation addressing non-compliance/s)

**Add New Sub-Clause
14.16
Foreign Taxation**

The prices bid by the Contractor shall include all taxes, duties, and other charges imposed outside the Employer's country on the production, manufacture, sale, and transport of the Contractor's Equipment, Plant, materials, and supplies to be used on or furnished under the Contract, and on the services performed under the Contract.

**Add New Sub-Clause
14.17
Local Taxation**

The prices bid by the Contractor shall include all customs duties, import duties, business taxes, and income and other taxes that may be levied in accordance with the laws and regulations in being on the date 28 days prior to the latest date for submission

**Add New Sub-Clause
14.18
Income Taxes on Staff**

The Contractor's staff and labour will be liable to pay personal income taxes in the Employer's country in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Contractor shall

perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

Section X. Contract Forms

Table of Forms

Notification of Award	430
Contract Agreement	431
Performance Security	433
Environmental, Social, Health and Safety (ESHS) Performance Security.....	437
Advance Payment Security	439
Retention Money Security	441

Notification of Award

LETTER OF ACCEPTANCE

[letterhead paper of the Employer]

[date]

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

This is to notify you that your Bid dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by our Agency.

You are requested to furnish the Performance Security and an Environmental, Social, Health and Safety Performance Security ***[Delete ESHS Performance Security if it is not required under the contract]*** within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms and the ESHS Performance Security Form, ***[Delete reference to the ESHS Performance Security Form if it is not required under the contract]*** included in Section X, Contract Forms, of the Bidding Documents

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Contract Agreement

Contract Agreement

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

WHEREAS the Employer desires that the Works known as _____ 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.

- (i) the Letter of Acceptance
- (ii) The Minutes of the Pre- Award Meeting (any other post tender correspondence, not included in the minutes, shall not form part of the Contract Document)
- (iii) The Bid, Appendices and Schedules
- (iv) Clarifications and Addenda to Bid documents
- (v) The Particular Conditions – Part A
- (vi) The Particular Conditions – Part B
- (vii) The General Conditions of Contract
- (viii) The Special Specifications
- (ix) The Standard Specifications for Road and Bridge Construction 1986
- (x) The Scope of Works – Part 2, Section VII : Part A
- (xi) The Drawings
- (xii) The Priced Bill of Quantities
- (xiii) the completed Schedules and any other documents forming part of the contract, including, but not limited to:
 - i. the ESHS Management Strategies and Implementation Plans; and
 - ii. Code of Conduct (ESHS).

3. In consideration of the payments to be made by the Employer to the Contractor as specified 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 _____ on the day, month and year specified above.

Signed by _____ (for the Employer)

Signed by _____ (for the Contractor)

Performance Security

Option 1: (Demand Guarantee)

Beneficiary: _____

Date: _____

PERFORMANCE GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

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

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of, 2...², and any demand for payment under it must be received by us at this office indicated above on or before that date.

¹ The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

² Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Employer should note that in the event of an extension of this date 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 Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Option 2: Performance Bond

By this Bond _____ as Principal (hereinafter called “the Contractor”) and _____] as Surety (hereinafter called “the Surety”), are held and firmly bound unto _____] as Obligee (hereinafter called “the Employer”) in the amount of _____, for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a written Agreement with the Employer dated the _____ day of _____, 20 ____, for _____ in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Employer to be, in default under the Contract, the Employer having performed the Employer’s obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a Bid or bids from qualified Bidders for submission to the Employer for completing the Contract in accordance with its terms and conditions, and upon determination by the Employer and the Surety of the lowest responsive Bidder, arrange for a Contract between such Bidder and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term “Balance of the Contract Price,” as used in this paragraph, shall mean the total amount payable by Employer to Contractor under the Contract, less the amount properly paid by Employer to Contractor; or
- (3) pay the Employer the amount required by Employer to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Employer named herein or the heirs, executors, administrators, successors, and assigns of the Employer.

In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this _____ day of _____ 20_____
_____.

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

Environmental, Social, Health and Safety (ESHS) Performance Security ESHS Demand Guarantee

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of Employer]*

Date: *_ [Insert date of issue]*

ESHS PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

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

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its Environmental, Social, Health and/or Safety (ESHS) obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one (1) year, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee

This guarantee shall expire, no later than the Day of, 2...², and any demand for payment under it must be received by us at this office indicated above on or before that date.

¹ The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency (cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

² Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Employer should note that in the event of an extension of this date 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

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

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 [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Advance Payment Security

Demand Guarantee

Beneficiary: _____

Date: _____

ADVANCE PAYMENT GUARANTEE No.: _____

Guarantor: _____

We have been informed that _____ (hereinafter called "the Applicant") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (_____) is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) ¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above

¹ The Guarantor shall insert an amount representing the amount of the advance payment and 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.

has been credited to the Applicant on its account number _____ at _____.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified 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 ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the ___ day of ____, 2____,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..

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

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 Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

Retention Money Security

Demand Guarantee

_____ [Guarantor letterhead or SWIFT identifier code]

Beneficiary: _____ [Insert name and Address of Employer]

Date: _____ [Insert date of issue]

RETENTION MONEY GUARANTEE No.: _____ [Insert guarantee reference number]

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that _____ [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "the Applicant") has entered into Contract No. _____ [insert reference number of the contract] dated _____ with the Beneficiary, for the execution of _____ [insert name of contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of [insert the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and, if required, the ESHS Performance Security] is to be made against a Retention Money guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ [insert amount in figures] (_____) [amount in words]¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in

¹ The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Beneficiary.

breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Applicant on its account number _____ at _____ *[insert name and address of Applicant's bank]*.

This guarantee shall expire no later than the day of, 2...², and any demand for payment under it must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

² *Insert the same expiry date as set forth in the performance security, representing the date twenty-eight days after the completion date described in GC Clause 11.9. The Employer should note that in the event of an extension of this date 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 Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

