KENYA RURAL ROADS AUTHORITY

NAROK REGION

ROUTINE MAINTENANCE OF
ROAD NUMBER; C705
ROAD NAME; OLOLPIRONITO – EOR EKULE
TENDER NUMBER; KeRRA/011/NRK/NE/22%/039/2-45-19/20-018
CONSTITUENCY: NAROK EAST

BID DOCUMENT FOR ROUTINE MAINTENANCE

- **INVITATION FOR TENDERS**
- **INSTRUCTIONS TO BIDDERS**
- **QUALIFICATION CRITERIA**
- **CONDITIONS OF CONTRACT**
- **APPENDIX TO FORM OF AGREEMENT**
- **STANDARD FORMS**
- **SPECIFICATIONS, DRAWINGS AND BILLS OF QUANTITIES**

NOVEMBER 2019

The Engineer	**The Employer**
GENERAL MANAGER (MAINTENANCE), **KENYA RURAL ROADS AUTHORITY,** **P.O. BOX 48151–00100,** **NAIROBI.**	**DIRECTOR GENERAL,** **KENYA RURAL ROADS AUTHORITY,** **P.O. BOX 48151–00100,** **NAIROBI.**

STANDARD TENDER DOCUMENT

FOR

PROCUREMENT OF WORKS

- ROUTINE MAINTENANCE WORKS

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SECTION I: INVITATION TO BID

Tender reference No. KeRRA/011/NRK/NE/22%/039/2-45-19/20-018

Tender Name: Routine Maintenance of Ololpironito – Eor Ekule Road (C705)

1.1 The Kenya Rural Roads Authority – Narok Region invites sealed tenders for the Routine maintenance of Ololpironito – Eor Ekule Road (C705)

1.2 Interested eligible candidates may obtain further information and inspect tender documents at Kenya Rural Roads Authority – Narok Region procurement office, P. O. Box 398 – 20500 Narok opposite Narok County Government offices during normal working hours.

1.3 A complete set of tender documents may be obtained by interested candidates upon payment of non-refundable fees of Kshs. 1,000.00 at **Kenya Commercial Bank Account No. 1114343196 account name KeRRA A-I-A.** or be downloaded from KeRRA website at www.tenders.kerra.go.ke for free.

1.4 Prices quoted should be net inclusive of all taxes, must be in Kenya shillings and shall remain valid for **120** days from the closing date of tender.

1.5 Completed tender documents are to be enclosed in plain sealed envelopes marked with Tender name and reference number and deposited in the Tender Box at Narok Regional Office or to be addressed to Kenya Rural Roads Authority, Narok Region, and P. O. Box 398 – 20500 Narok to be received on or before the date in the Tender Advertisement.

1.6 Tenders will be opened immediately thereafter in the presence of the Candidates or their representatives who choose to attend at Kenya Rural Roads Authority, Narok Region, and P. O. Box 398 – 20500 Narok procurement office

For (Regional Manager – Narok Region)

SECTION II: INSTRUCTIONS TO TENDERERS

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INSTRUCTIONS TO TENDERERS.

1. General

1.1 The Employer as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The successful Tenderer will be expected to complete the Works by the Intended Completion Date specified in the said Appendix.

1.2 Tenderers shall include the following information and documents with their tenders, unless otherwise stated:

(a) **Certified** Copy of certificate of Incorporation / Business Registration Certificate
(b) **Certified** Copy of current CR12
(c) **Certified** Copy of National Identity Card (I.D) / Valid National passport of all Directors of the company
(d) Copy of PIN and VAT Certificate
(e) Copy of Valid Tax Compliance Certificate
(f) Copy of Valid Certificate of Registration and Practicing Licence from the National Construction Authority (NCA 1 - 8)
(g) Authority for person signing the Tender (Provide Power of Attorney)
(h) Authority to seek references from Tenderer's Bankers
(i) Proof of Bank account in the Contractor's name (attach Bank Statement for last three (3) Months)
(j) Provide signed and stamped audited accounts for the last 3 years
(k) Serialization or Pagination of bid documents

1.3 The Tenderer shall bear all costs associated with the preparation and submission of his tender, and the Employer will in no case be responsible or liable for those costs.

1.4 The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Tenderer's own expense.

1.5 The procurement entity's employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.

1.6 The price to be charged for the tender document shall not exceed **Kshs.1,000/=**

1.7 The procuring entity shall allow the tenderer to review the tender document free of charge before purchase.

2. Tender Documents

2.1 The complete set of tender documents comprises the documents listed here below and any addenda issued in accordance with clause 2.4 herebelow:-

(a) these instructions to Tenderers
(b) Form of Tender
(c) Conditions of Contract and Appendix to Form of Agreement
(d) Specifications
(e) Drawings
(f) Bills of Quantities
(g) Other materials required to be filled and submitted in accordance with these Instructions and Conditions

2.2 The Tenderer shall examine all instructions, forms and specifications in the tender documents. Failure to furnish all information required by the tender documents may result in rejection of his tender.

2.3 A prospective Tenderer making inquiries of the tendering documents may notify the Employer in writing or by cable, telex or facsimile at the address indicated in the letter of invitation to tender. The Employer will respond to any request for clarification received earlier than seven [7] days prior to the deadline for submission of tenders. Copies of the Employer's response will be forwarded to all persons issued with tendering documents, including a description of the inquiry, but without identifying its source.

2.4 Before the deadline for submission of tenders, the Employer may modify the tendering documents by issuing addenda. Any addendum thus issued shall be part of the tendering documents and shall be communicated in writing or by cable, telex or facsimile to all Tenderers. Prospective Tenderers shall acknowledge receipt of each addendum in writing to the Employer.

2.5 To give prospective Tenderers reasonable time in which to take an addendum into account in preparing their tenders, the Employer shall extend, as necessary, the deadline for submission of tenders in accordance with clause 4.2 herebelow.

3. Preparation of Tenders

3.1 All documents relating to the tender and any correspondence shall be in English Language.

3.2 The tender submitted by the Tenderer shall comprise the following:-

(a) The Tender;

(b) Tender Security;

(c) Priced Bill of Quantities for lump-sum Contracts

(d) Any other materials required to be completed and submitted by Tenderers.

3.3 The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by the Tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. All duties, taxes and other levies payable by the Contractor under the Contract, as of 30 days prior to the deadline for submission of tenders, shall be included in the tender price submitted by the Tenderer.

3.4 The rates and prices quoted by the Tenderer shall not be subject to any adjustment during the performance of the Contract.

3.5 The unit rates and prices shall be in Kenya Shillings.

3.6 Tenders shall remain valid for a period of **One Twenty (120**) days from the date of submission. However in exceptional circumstances, the Employer may request that the Tenderers extend the period of validity for a specified additional period. The request and the Tenderers' responses shall be made in writing.

3.7 The Tenderer shall prepare one original of the documents comprising the tender documents as described in these Instructions to Tenderers.

3.8 The original shall be typed or written in indelible ink and shall be signed by a person or persons duly authorised to sign on behalf of the Tenderer. All pages of the tender where alterations or additions have been made shall be initialed by the person or persons signing the tender.

3.9 Clarification of tenders shall be requested by the tenderer to be received by the procuring entity not later than 7 days prior to the deadline for submission of tenders.

3.10 The procuring entity shall reply to any clarifications sought by the tenderer within **7 days** of receiving the request to enable the tenderer to make timely submission of its tender.

4. Submission of Tenders

4.1 The tender duly filled and sealed in an envelope shall;-

(a) be addressed to the Employer at the address provided in the invitation to tender;

[b] bear the name and identification number of the Contract as defined in the invitation to tender; and

[c] provide a warning not to open before the specified time and date for tender opening.

4.2 Tenders shall be delivered to the Employer at the address specified above not later than the time and date specified in the invitation to tender.

4.3 The tenderer shall not submit any alternative offers unless they are specifically required in the tender documents.

Only one tender may be submitted by each tenderer. Any tenderer who fails to comply with this requirement will be disqualified.

4.4 Any tender received after the deadline for opening tenders will be returned to the tenderer un-opened.

4.5 The Employer may extend the deadline for submission of tenders by issuing an amendment in accordance with sub-clause 2.5 in which case all rights and obligations of the Employer and the Tenderers previously subject to the original deadline will then be subject to the new deadline.

5. Tender Opening and Evaluation

5.1 The tenders will be opened in the presence of the Tenderers' representatives who choose to attend at the time and in the place specified in the invitation to tender.

5.2 The Tenderers' names, the total amount of each tender and such other details as may be considered appropriate, will be announced at the opening by the Employer . Minutes of the tender opening, including the information disclosed to those present will also be prepared by the Employer.

5.3 Information relating to the examination, clarification, evaluation and comparison of tenders and recommendations for the award of the Contract shall not be disclosed to Tenderers or any other persons not officially concerned with such process until the award to the successful Tenderer has been announced. Any effort by a Tenderer to influence the Employer's officials, processing of tenders or award decisions may result in the rejection of his tender.

5.4 Tenders determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows:

(a) where there is a discrepancy between the amount in figures and the amount in words, the amount in words will prevail; and

(b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail, unless in the opinion of the Employer's representative, there is an obvious typographical error, in which case the adjustment will be made to the entry containing that error.

(c) In the event of a discrepancy between the tender amount as stated in the Form of Tender and the corrected tender figure in the main summary of the Bill of Quantities/Quotation, the amount as stated in the Form of Tender shall prevail.

(d) The Error Correction Factor shall be computed by expressing the difference between the tender amount and the corrected tender sum as a percentage of the Corrected Builder's Work (i.e. corrected tender sum less P.C. and Provisional Sums).

(e) The Error Correction Factor shall be applied to all Builder's Work (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

(f) The amount stated in the tender will be adjusted in accordance with the above procedure for the correction of errors and with concurrence of the Tenderer, shall be considered as binding upon the Tenderer. If the Tenderer does not accept the corrected amount, the tender may be rejected and the Tender Security forfeited.

5.5 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.

5.6 Contract price variations shall not be allowed for contracts not exceeding one year (12 months)

5.7 Where contract price variation is allowed, the valuation shall not exceed 25% of the original contract price.

5.8 Price variation requests shall be processed by the procuring entity within 30 days of receiving the request.

5.9 To assist in the examination, evaluation, and comparison of tenders, the Employer at his discretion, may request [in writing] any Tenderer for clarification of the tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, telex or facsimile but no change in the tender price or substance of the tender shall be sought, offered or permitted.

5.10 The Tenderer shall not influence the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. Any effort by the Tenderer to influence the Employer or his employees in his decision on tender evaluation, tender comparison or Contract award may result in the rejection of the tender.

6. Award of Contract

6.1 The award of the Contract will be made to the Tenderer who has offered the lowest evaluated tender price.

6.2 Notwithstanding the provisions of clause 6.1 above, the Employer reserves the right to accept or reject any tender and to cancel the tendering process and reject all tenders at any time prior to the award of Contract without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform the affected Tenderer or Tenderers of the grounds for the action.

6.3 The Tenderer whose tender has been accepted will be notified of the award prior to expiration of the tender validity period in writing or by cable, telex or facsimile. This notification (hereinafter and in all Contract documents called the “Letter of Acceptance”) will state the sum [hereinafter and in all Contract documents called the “Contract Price” which the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract. The contract shall be formed on the parties signing the contract. At the same time the other tenderers shall be informed that their tenders have not been successful.

6.4 The Contract Agreement will incorporate all agreements between the Employer and the successful Tenderer. It will be signed by the Employer and sent to the successful Tenderer, within 30 days following the notification of award. Within 21 days of receipt, the successful Tenderer will sign the Agreement and return it to the Employer.

6.5 Within 21 days after receipt of the Letter of Acceptance, the successful Tenderer shall deliver to the Employer a Performance Security amount stipulated in the Appendix to Conditions of Contract.

6.6 The parties to the contract shall have it signed within 30 days from the date of notification of contract award unless there is an administrative review request.

6.7 The procuring entity may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.

6.8 The procuring entity shall give prompt notice of the termination to the tenderers and on request give its reasons for termination within 14 days of receiving the request from any tenderer.

7. Corrupt and fraudulent practices

7.1 The procuring entity requires that the tenderer observes the highest standard of ethics during the procurement process and execution of the contract. A tenderer shall sign a declaration that he has not and will not be involved in corrupt and fraudulent practices.

7.2 The procuring entity will reject a tender if it determines that the tenderer recommended for award has engaged in corrupt and fraudulent practices in competing for the contract in question.

7.3 Further a tenderer who is found to have indulged in corrupt and fraudulent practices risks being debarred from participating in public procurement in Kenya.

SECTION III: QUALIFICATION CRITERIA

Qualification Criteria			Compliance Requirements	Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Submission Requirements**
1. Eligibility				
1.1	**Eligibility**	Nationality in accordance with confidential business Questionnaire in the standard forms	Must meet requirement	Refer to standard form section 7
1.4	**Incorporation & Registration**	Pursuant to sub clause 1.2 the following shall be provided; - Certified Copy of Certificate of incorporation to show that the applicant is a registered company and legally authorised to do business in Kenya - Proof of registration with the National Construction Authority Category NCA 7 and above for Road Works. - Proof of prequalification with KeRRA Narok with the respective category as advertised	Must meet requirement	Refer to standard form section 7

Qualification Criteria			Compliance Requirements	Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Submission Requirements**
2.1	**History of Non-Performing Contracts**	Non-performance of a contract did not occur within the last **three (3)** years prior to the deadline for application submission based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract, and where all appeal instances available to the applicant have been exhausted.	Must meet requirement by itself or as party to past	
2.2	**Pending Litigation**	All pending litigation shall in total not represent more than fifty percent (50%)] of the Applicant's net worth and shall be treated as resolved against the Applicant.	Must meet requirement by itself or as party to past	Refer to standard form section 7
3.1	**Financial Performance**	Submission of audited balance sheets or if not required by the law of the applicant's country, other financial statements acceptable to the Employer, for the last two [2] years to demonstrate: (a) the current soundness of the applicants financial position and its prospective long term profitability, and (b) capacity to have a cash flow amount of min KShs 500,000.00 or equivalent working capital for works valued between 3 to 6 million	N/A	Refer to standard form section 7
3.2	**Average Annual Construction Turnover**	Minimum average annual construction turnover of KShs 1 Million, calculated as total certified payments received for contracts in progress or completed, within the last three years		Refer to standard form section 7

Qualification Criteria			Compliance Requirements	Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Submission Requirements**
4.1	**General Construction Experience**	Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the last five years prior to the applications submission deadline		Refer to standard form section 7
4.2(a)	**Specific Construction Experience**	Participation as contractor, management contractor or subcontractor, in at least two (2) contracts within the last five (5) years, each with a value of at least KShs. 300,000.00 (three hundred thousand), that have been successfully and substantially completed and that are similar to the proposed works. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Scope of Works		Refer to standard form section 7
4.2(b)		b) For the above or other contracts executed during the period stipulated in 4.2(a) above, a minimum construction experience in at least one (1) of: - Routine maintenance - Spot improvement & rehabilitation works.		Refer to standard form section 7
4.3	**Work Methodology**	Submission of a brief work methodology		Refer to standard form section 7
5. Equipment Holding				

Qualification Criteria			Compliance Requirements	Documentation
No.	**Subject**	**Requirement**	**Single Entity**	**Submission Requirements**
5.1	**Minimum number of Equipment**	The bidder must indicate the minimum the core plant and equipment considered by the company to be necessary for undertaking the project together with proof of ownership	Must meet the requirement	Refer to standard form section 7
6. Current Commitment				
6.1	**On-going contracts**	The total value of current works on the on-going contracts must not exceed KShs. 3 million for contracts not exceeding 3 million and Kshs. 10million for contracts between three to six million	Must meet requirements	
7. Site Staff				
	Foremen	The site staff shall posses minimum levels set below; Qualification = Minimum Certificate		Refer to guideline notes

SECTION IV: CONDITIONS OF CONTRACT

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CONDITIONS OF CONTRACT

1. Definitions

1.1 In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated;

"Bills of Quantities" means the priced and completed Bill of Quantities forming part of the tender[where applicable].

"Schedule of Rates" means the priced Schedule of Rates forming part of the tender [where applicable].

"The Completion Date" means the date of completion of the Works as certified by the Employer's Representative.

"The Contract" means the agreement entered into by the Employer and the Contractor as recorded in the Agreement Form and signed by the parties.

"The Contractor" refers to the person or corporate body whose tender to carry out the Works has been accepted by the Employer.

"The Contractor's Tender" is the completed tendering document submitted by the Contractor to the Employer.

"The Contract Price" is the price stated in the Letter of Acceptance.

"Days" are calendar days; "Months" are calendar months.

"A Defect" is any part of the Works not completed in accordance with the Contract.

"The Defects Liability Certificate" is the certificate issued by Employer's Representative upon correction of defects by the Contractor.

"The Defects Liability Period" is the period named in the Appendix to Conditions of Contract and calculated from the Completion Date.

"Drawings" include calculations and other information provided or approved by the Employer's Representative for the execution of the Contract.

"Employer" Includes Central or Local Government administration, Universities, Public Institutions and Corporations and is the party who employs the Contractor to carry out the Works.

"Equipment" is the Contractor's machinery and vehicles brought temporarily to the Site for the execution of the Works.

"Site" means the place or places where the permanent Works are to be carried out including workshops where the same is being prepared.

"Materials" are all supplies, including consumables, used by the Contractor for incorporation in the Works.

"Employer's Representative" is the person appointed by the Employer and notified to the Contractor for the purpose of supervision of the Works.

"Specification" means the Specification of the Works included in the Contract.

"Start Date" is the date when the Contractor shall commence execution of the Works.

" A Subcontractor" is a person or corporate body who has a Contract with the Contractor to carry out a part of the Work in the Contract, which includes Work on the Site.

"Temporary works" are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

" A Variation" is an instruction given by the Employer's Representative which varies the Works.

"The Works" are what the Contract requires the Contractor to construct, install, and turnover to the Employer.

2. Contract Documents

2.1 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;

(1) Agreement,
(2) Letter of Acceptance,
(3) Contractor's Tender,
(4) Conditions of Contract,
(5) Specifications,
(6) Drawings,
(7) Bills of Quantities

3. Employer's Representative's Decisions

3.1 Except where otherwise specifically stated, the Employer's Representative will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

4. Works, Language and Law of Contract

4.1 The Contractor shall construct and install the Works in accordance with the Contract documents. The Works may commence on the Start Date and shall be carried out in accordance with the Program submitted by the Contractor, as updated with the approval of the Employer's Representative, and complete them by the Intended Completion Date.

4.2 The ruling language of the Contract shall be English language and the law governing the Contract shall be the law of the Republic of Kenya.

5. Safety, Temporary works and Discoveries

5.1 The Contractor shall be responsible for design of temporary works and shall obtain approval of third parties to the design of the temporary works where required.

5.2 The Contractor shall be responsible for the safety of all activities on the Site.

5.3 Any thing of historical or other interest or significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Employer's Representative of such discoveries and carry out the Employer's Representative's instructions for dealing with them.

6 Work Program and Sub-contracting

6.1 Within seven days after Site possession date, the Contractor shall submit to the Employer's Representative for approval a program showing the general methods, arrangements, order and timing for all the activities in the Works.

6.2 The Contractor may sub-contract the Works (but only to a maximum of 25 percent of the Contract Price) with the approval of the Employer's Representative. However, he shall not assign the Contract without the approval of the Employer in writing. Sub-contracting shall not alter the Contractor's obligations.

7 The site

7.1 The Employer shall give possession of all parts of the Site to the Contractor.

7.2 The Contractor shall allow the Employer's Representative and any other person authorised by the Employer's Representative ,access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

8 Instructions

8.1 The Contractor shall carry out all instructions of the Employer's Representative which are in accordance with the Contract.

9 Extension of Completion Date

9.1 The Employer's Representative shall extend the Completion Date if an occurrence arises which makes it impossible for completion to be achieved by the Intended Completion Date. The Employer's Representative shall decide whether and by how much to extend the Completion Date.

9.2 For the purposes of this clause, the following occurrences shall be valid for consideration;

Delay by:-(a) force majeure, or

(b) reason of any exceptionally adverse weather conditions, or

(c) reason of civil commotion, strike or lockout affecting any of the trades employed upon the Works or any of the trades engaged in the preparation, manufacture or transportation of any of the goods or materials required for the Works, or

(d) reason of the Employer's Representative's instructions issued under these Conditions, or

(e) reason of the contractor not having received in due time necessary instructions, drawings, details or levels from the Employer's Representative for which he specifically applied in writing on a date which having regard to the date for Completion stated in the appendix to these Conditions or to any extension of time then fixed under this clause was neither unreasonably distant from nor unreasonably close to the date on which it was necessary for him to receive the same, or

(f) delay on the part of artists, tradesmen or others engaged by the Employer in executing work not forming part of this Contract, or

(g) reason of delay by statutory or other services providers or similar bodies engaged directly by the Employer, or

(h) reason of opening up for inspection of any Work covered up or of the testing or any of the Work, materials or goods in accordance with these conditions unless the inspection or test showed that the Work, materials or goods were not in accordance with this Contract, or

(i) reason of delay in appointing a replacement Employer's Representative, or

(j) reason of delay caused by the late supply of goods or materials or in executing Work for which the Employer or his agents are contractually obliged to supply or to execute as the case may be, or

(k) delay in receiving possession of or access to the Site.

10 Management Meetings

10.1 A Contract management meeting shall be held regularly and attended by the Employer's Representative and the Contractor. Its business shall be to review the plans for the remaining Work. The Employer's Representative shall record the business of management meetings and provide copies of the record to those attending the meeting and the Employer. The responsibility of the parties for actions to be taken shall be decided by the Employer's Representative either at the management meeting or after the management meeting and stated in writing to all who attend the meeting.

10.2 Communication between parties shall be effective only when in writing.

11 Defects

11.1 The Employer's Representative shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Employer's Representative may instruct the Contractor to search for a defect and to uncover and test any Work that the Employer's Representative considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor. However if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.

11.2 The Employer's Representative shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins

at Completion, and is defined in the Appendix to Form of Agreement.

11.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by the Employer's Representative's notice. If the Contractor has not corrected a defect within the time specified in the Employer's Representative's notice, the Employer's Representative will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

12 Bills of Quantities

12.1 The Bills of Quantities shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rates in the Bills of Quantities for each item. Items against which no rate is entered by the Tenderer will not be paid for when executed and shall be deemed covered by the rates for other items in the Bills of Quantities.

12.2 Where Bills of Quantities do not form part of the Contract, the Contract Price shall be a lump sum (which shall be deemed to have been based on the rates in the Schedule of Rates forming part of the tender) and shall be subject to re-measurement after each stage.

13 Variations

13.1 The Contractor shall provide the Employer's Representative with a quotation for carrying out the variations when requested to do so. The Employer's Representative shall assess the quotation and shall obtain the necessary authority from the Employer before the variation is ordered.

13.2 If the Work in the variation corresponds with an item description in the Bill of Quantities, the rate in the Bill of Quantities shall be used to calculate the value of the variation. If the nature of the Work in the variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.

13.3 If the Contractor's quotation is unreasonable, the Employer's Representative may order the variation and make a change to the Contract Price, which shall be based on the Employer's Representative's own forecast of the effects of the variation on the Contractor's costs.

14 Payment Certificates and Final Account

14.1 The Contractor shall be paid after each of the following stages of Work listed here below (subject to re-measurement by the Employer's Representative of the Work done in each stage before payment is made). In case of lump-sum Contracts, the valuation for each stage shall be based on the quantities so obtained in the re-measurement and the rates in the Bill of Quantities.

Upon deciding that Works included in a particular stage are complete, the Contractor shall submit to the Employer's Representative his application for payment. The Employer's Representative shall check, adjust if necessary and certify the amount to be paid to the Contractor within 21 days of receipt of the Contractor's application .The Employer shall pay the Contractor the amounts so certified within 30 days of the date of issue of each Interim Certificate.

14.2 The Contractor shall supply the Employer's Representative with a detailed final account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Employer's Representative shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, the Employer's Representative shall issue within 21 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, the Employer's Representative shall decide on the amount payable to the Contractor and issue a Final Payment Certificate. The Employer shall pay the Contractor the amount so certified within 60 days of the issue of the Final Payment Certificate.

14.3 If the period laid down for payment to the Contractor upon each of the Employer's Representative's Certificate by the Employer has been exceeded, the Contractor shall be entitled to claim simple interest calculated pro-rata on the basis of the number of days delayed at the central Bank of Kenya's average base lending rate prevailing on the first day the payment becomes overdue. The Contractor will be required to notify the Employer within 15 days of receipt of delayed payments of his intentions to claim interest.

15. Insurance

15.1 The Contractor shall be responsible for and shall take out appropriate cover against, among other risks, personal injury; loss of or damage to the Works, materials and plant; and loss of or damage to property.

16. Liquidated Damages

16.1 The Contractor shall pay liquidated damages to the Employer at the rate 0.001 per cent of the Contract price per day for each day that the actual Completion Date is later than the Intended Completion Date except in the case of any of the

occurrences listed under clause 9.2. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

17. Completion and Taking Over

17.1 Upon deciding that the Work is complete the Contractor shall request the Employer's Representative to issue a Certificate of Completion of the Works, upon deciding that the Work is completed.

The Employer shall take over the Site and the Works within seven days of the Employer's Representative issuing a Certificate of Completion.

18. Termination

18.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. These fundamental breaches of Contract shall include, but shall not be limited to, the following;

(a) the Contractor stops Work for 30 days continuously without reasonable cause or authority from the Employer's Representative;

(b) the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

(c) a payment certified by the Employer's Representative is not paid by the Employer to the Contractor within 30 days after the expiry of the payment periods stated in sub clauses 14.2 and 14.3 hereinabove.

(d) the Employer's Representative gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time.

18.2 If the Contract is terminated, the Contractor shall stop Work immediately, and leave the Site as soon as reasonably possible. The Employer's Representative shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

19. Payment Upon Termination

19.1 The Employer may employ and pay other persons to carry out and complete the Works and to rectify any defects and may enter upon the Works and use all materials on Site, plant, equipment and temporary works.

19.2 The Contractor shall, during the execution or after the completion of the Works under this clause, remove from the Site as and when required within such reasonable time as the Employer's Representative may in writing specify,any

temporary buildings, plant, machinery, appliances, goods or materials belonging to him, and in default thereof , the Employer may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the Contractor.

19.3 Until after completion of the Works under this clause, the Employer shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefor the Employer's Representative shall certify the amount of expenses properly incurred by the Employer and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract, the difference shall be a debt payable to the Employer by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by the Employer to the Contractor.

20. Corrupt Gifts and Payments of Commission

20.1 The Contractor shall not;

(a) Offer or give or agree to give to any person in the service of the Employer any gifts or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract with the Employer or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract with the Employer.

(b) Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the Laws of Kenya.

21. Settlement of Disputes

21.1 Any dispute arising out of the Contract which cannot be amicably settled between the parties shall be referred by either party to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the chairman of the Chartered Institute of Arbitrators, Kenya branch, on the request of the applying party.

SECTION V: APPENDIX TO FORM OF AGREEMENT

This Appendix to Form of Agreement forms part of the Agreement.

Item	**Data**
Time for Completion	Three Months,
Priority of Documents	The documents forming the Contract shall be interpreted in the following order of priority: • the Contract Agreement and Appendix to form of agreement • the Letter of Acceptance • the Form of Tender • the Conditions of Contract, Part II - Conditions of Particular Application • the Conditions of Contract, Part I - General Conditions of Contract • the Specifications • the Drawings, • the Priced Bill of Quantities
Law of Contract	Laws of the Republic of Kenya
Language	English
Provision of Site	On Commencement Date
Name and Address of Employer	Director General Kenya Rural Roads Authority P.O. Box 48151-00100 **Nairobi**
Authorised Person	General Manager (Maintenance), Kenya Rural Roads Authority P.O. Box 48151-00100 **Nairobi**
Name and Address of the Engineer	Regional Manager, Kenya Rural Roads Authority P. O. Box 398 - 20500 **Narok**
Name and Address of Engineer's Representative	Constituency Roads Officer

Item	**Data**
Penalty to the Contractor for Employer paying workers on his behalf	10% of the amount paid to the workers.
Performance Security Amount Form	Not Applicable Not Applicable Not Applicable
Requirements of Contractors Design	Not applicable
Programme ⇨ Time of Submission	Within 14 days of Commencement Date
⇨ Form of Programme ⇨ Interval Updates	Bar Chart As requested by the RM
Liquidated Damages Amount payable due to failure to complete	0.01% of Contract Price per Day to a limit of 1% of Contract Price.
Defects Liability	Not Applicable
Period of notifying defects	Not Applicable
Percentage of Retention	Not Applicable
Maximum Amount of Advance Payment	Not Applicable
Form of Guarantee for Advance Payment	Not Applicable
Valuation of Works	Re-measurements with Bills of Quantities
Repayment Schedule for Advance Payment	Not Applicable
Minimum Amount of Interim Payment	Ksh. 50% of value of contract
Currency of Payment	Kenya Shilling
Rate of Interest	Simple Interest at a rate of 2% above mean Base Lending Rate as issued by the Central Bank of Kenya.
Insurance	Not required
Insurance ⇨ The Works, materials plants & fees- Contractor's All risks	Amount of Cover The Contract Price stated in the Agreement +15%+replacement cost of equipment on site.

Item	**Data**
⇨ Third party injury to persons and damage to property	Ksh. ……(RM to insert figure)
⇨ Workers compensation (WIBA- workers injury benefits policy)	As per work injury benefits act 2007 laws of Kenya
Arbitration	
⇨ Rules	CAP 49 of the Laws of Kenya
⇨ Appointing Authority	Chairman Chartered Institute of Arbitrators, Kenya Branch.
⇨ Place of Arbitration	Kenya Rural Roads Authority, Headquarters

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FORM OF TENDER

TO: _____[Name of Employer) _____[Date]

_____[Name of Contract]

Dear Sir,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above Works, We, the undersigned offer to construct, install and complete such Works and remedy any defects therein for the sum of Kshs._____[Amount in figures]Kenya Shillings_____ _____[Amount in words]

2. We undertake, if our Tender is accepted, to commence the Works on the commencement date and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix.

3. We agree to abide by this Tender until _____[Insert date], and it shall remain binding upon us and may be accepted at any time before that date.

4. Unless and until a formal Agreement is prepared and executed this Tender together with your written acceptance thereof, shall constitute a binding Contract between us.

4. We understand that you are not bound to accept the lowest or any Tender you may receive.

Dated this _____ day of _____20_____

Signature _____in the capacity of_____

duly authorized to sign Tenders for and on behalf of _____[Name of Tenderer] of

_____[Address of Tenderer]

Witness: Name_____

Address_____

Signature_____

Date_____

FORM OF AGREEMENT

THIS AGREEMENT is made on the ……day of …..., 2016 between the **Kenya Rural Roads Authority, of P.O. BOX 48151 - 00100, Nairobi, Kenya** hereinafter called the "**Employer** "of the one part and ----------,hereinafter called the "**Contractor**" of the other part.

WHEREAS the Employer is desirous that certain works should be executed, viz: ----------
And has accepted a Bid by the Contractor to execute, complete and maintain such works
NOW THIS AGREEMENT WITNESSETH as follows:

In this agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

The said BID dated ----------

- Conditions of Contract; Parts I and II
- The Standard and Special Specifications;
- Priced Bill of Quantities;
- Letter of Acceptance;
- Form of Tender
- Drawings;
- Appendix to the Form of Agreement
- Schedule Of Supplementary Information
- Other Documents/Materials/Conditions agreed and documented.

All aforesaid documents are hereinafter referred to as "**The Contract**".
In consideration of the payment to be made by the **Employer** to the **Contractor**, the Contractor covenants with the Employer to execute and complete the Works in conformity with the provisions of the Contract.

The Employer hereby covenants to pay the Contractor in consideration of the execution, completion and maintenance of the Works at the Contract Price or such other sum as may become payable under the Contract at the times and in the manner prescribed by the Contract.
IN WITNESS WHEREOF the parties hereto have caused their respective common seals to be hereto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

SIGNED AND DELIVERED

By the said Employer:…….....…….....

Signature: ……..

Region:……

(Regional Manager, Kenya Rural Roads Authority)
(For and on behalf of the said Employer.)

In the presence of:…….....

Signature……

By the said Contractor: ……..

Signature……
Designation:…….
(For and on behalf of the said Contractor)

In the presence of : …….....

Signature:……

Address:…….

QUALIFICATION INFORMATION

TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full name of Tenderer;

   ……

2. Full address of Tenderer to which Tender correspondence is to be sent (unless an agent has been appointed below);

   ……

3. Telephone number (s) of Tenderer;

   ……

4. Facsimile of Tenderer;
   ……

5. Name of Tenderer's representative to be contacted on matters of the Tender during the Tender period;
   ……

6. Details of Tenderer's nominated agent (if any) to receive Tender notices (name, address, telephone, telefax);

   ……

   ……

_____
Signature of Tenderer

Make copy and deliver to:_____(Name of Employer) (The Tenderer shall leave one copy at the time of purchase of the Tender documents)

CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a) or 2 (b) whichever applies to your type of business.

You are advised that it is a serious offence to give false information on this Form.

Part 1 – General

Business Name ……

Location of business premises; Country/Town…….

Plot No…… Street/Road ……

Postal Address…… Tel No……..

Nature of Business……..…..

Current Trade Licensee No…… Expiring date…….……

Maximum value of business which you can handle at any time: Kshs ……

Name of your Bankers……..…

Branch……

Part 2 (b) – Partnership

Give details of partners as follows:

Name in full Nationality Citizenship Details Shares

1……

2……

3……

Part 2(c) – Registered Company:

Private or public…….....…

State the nominal and issued capital of the Company-

Nominal Kshs…….....……

Issued Kshs…….....…

Give details of all directors as follows:

Name in full . Nationality. Citizenship Details*. Shares.

1…….....…

2…….....…

3…….....…

4…….....…

Part 2(d) – Interest in the Firm:

Is there any person / persons in Kenya Rural Roads Authority – Narok Region who has interest in this firm? Yes/No…… (Delete as necessary)

I certify that the information given above is correct.

…… …… ……..…
(Title) (Signature) (Date)

* Attach proof of citizenship

CERTIFICATE OF TENDERER'S VISIT TO SITE

This is to certify that

[Name/s]……

……

Being the authorized representative/Agent of [Name of Tenderer]
……

……

participated in the organized inspection visit of the site of the works for the **Ololpironito – Eor Ekule Road**

held on …… day of……20……

Signed……
(Employer's Representative)

……

NOTE: This form is to be completed when the site visit is made

FORM OF WRITTEN POWER-OF-ATTORNEY

The Tenderer consisting of a joint venture shall state here below the name and address of his representative who is authorised to receive on his behalf correspondence in connection with the Tender.

……

(Name of Tenderer's Representative in block letters)

……

(Address of Tenderer's Representative)

……

(Signature of Tenderer's Representative)

KEY PERSONNEL

DESIGNATION	NAME	NATIONALITY	SUMMARY OF QUALIFICATIONS AND EXPERIENCE
1. 2. 3. 4. 5. 6			

I certify that the above information is correct.

…… …… ……..

(Title) (Signature) (Date)

SCHEDULE OF THE PROPOSED APPROPRIATE EQUIPMENT.

Mandatory minimum number of equipment required by the Employer for the execution of the project that the bidder must make available for the Contract

Item No.	Equipment Details	Minimum Number Required	No of Equipment Owned by the Bidder	No. of equipment to be hired
1	Grader			
2	Double drum vibrating pedestrian roller(3Tons)			
3	Self-propelled single drum vibrating (10Tons)			
4	Mobile concrete mixers			
5	Excavator/loader			
6	Concrete vibrators			
7	Tippers payload 7 – 10 tonnes			
8	Flat bed lorries			
9	Water tankers (10,000 litres capacity)			

The Bidder must attach certified copies of log books or lease agreement of the following

I certify that the above information is correct.

…… …… ……..
(Title) (Signature) (Date)

SCHEDULE OF COMPLETED CIVIL WORKS CARRIED OUT IN THE PREVIOUS YEARS

DESCRIPTION OF WORKS AND CLIENT	TOTAL VALUE OF WORKS (KSHS)	CONTRACT PERIOD (YEARS)	YEAR COMPLETED

I certify that the above Civil Works were successfully carried out and completed by ourselves.

…… …… ……

(Title) (Signature) (Date)

SCHEDULE OF ONGOING PROJECTS

DESCRIPTION OF WORK AND CLIENT	CONTRACT PERIOD	DATE OF COMMEN-CEMENT	DATE OF COMPLETION	TOTAL VALUE OF WORKS (KSHS.)	% COMPLETED TODATE

I certify that the above Civil Works are being carried out by ourselves and that the above information is correct.

…… …… ……
(Title) (Signature) (Date)

OTHER SUPPLEMENTARY INFORMATION

1. Financial reports for the last three years, balance sheets, profit and loss statements, auditors' reports etc. List them below and attach copies.

……

……

……

2. Evidence of access to financial resources to meet the qualification requirements. Cash in hand, lines of credit etc. List below and attach copies of supporting documents

……

……

……

3. Name, address , telephone, telex, fax numbers of the Tenderer's Bankers who may provide reference if contacted by the Employer.

……

……

……

4. Information on current litigation in which the Tenderer is involved.

OTHER PARTY (IES)	CAUSE OF DISPUTE	AMOUNT INVOLVED (KSHS)

I certify that the above information is correct.

…… …… ……

Title Signature Date

ADJUDICATOR'S AGREEMENT

Identification of Project:

……
(the "Project")

Name and address of the Employer:

……..
(the "Employer")

Name and address of the Contractor:

……..
(the "Contractor")

Name and address of the Adjudicator:

……..
(the "Adjudicator")

Whereas the Employer and the Contractor have entered into a Contract ("the Contract") for the execution of the Project and wish to appoint the Adjudicator to act as adjudicator in accordance with the Rules for Adjudication ["the Rules"].

The Employer, Contractor and Adjudicator agree as follows:

1. The Rules and dispute provisions of the Contract shall form part of this Agreement.

2. The Adjudicator shall be paid:

   A retainer fee of ……..…….. per calendar month(where applicable)

   A daily fee of ……..…

   Expenses (including the cost of telephone calls, courier charges, faxes and telexes incurred in connection with his duties; all reasonable and necessary travel expenses, hotel accommodation and subsistence and other direct travel expenses).

   Receipts will be required for all expenses.

3. The Adjudicator agrees to act as Adjudicator in accordance with the Rules and has disclosed to the Parties any previous or existing relationship with the Parties or others concerned with the Project.

4. This Agreement shall be governed by the laws of……

5. The Language of this Agreement shall be ……..

SIGNED BY ……

For and on behalf of the Employer in the presence of

Witness ……...
Name ……...
Address ……...
Date ……...

SIGNED BY ……

For and on behalf of the Contractor in the presence of

Witness ……...
Name ……...
Address ……...
Date ……...

SIGNED BY ……

For and on behalf of the Adjudicator in the presence of

Witness ……...
Name ……...
Address ……...
Date ……...

FRAUD & CORRUPTION

1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site.

2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed.

3 For the purposes of this Sub-Clause:

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

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

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

(iv) "Coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party.

4 The Contractor declares that:

a) They did not engage in any action to influence the Project implementation process to the detriment of the Employer, in particular no collusive practice took place nor will take place, and

The bidding proceedings, contract award, and execution have not and will not be subject to any corrupt practice as defined in the United Nations Convention to combat corruption dated 31 October 2003.

Dated this _____ day of _____20_____

Signature _____in the capacity of_____

duly authorized to sign Tenders for and on behalf of

_____[Name of Tenderer] of

_____[Address of Tenderer]

_____[Seal or Stamp of Tenderer]

ENVIRONMENTAL AND SOCIAL COMMITMENT

I have taken due note of the importance to comply with environmental and social standards and regulations.

I, the undersigned, […….] acting as the duly authorized representative of […….],

With respect to the submission of a bid for [……] in accordance with the invitation to tender No […….], I undertake to comply, and ensure that our subcontractors, if any, comply with international environmental and labour standards consistent with applicable law and regulations in the country of implementation of the Project, including the fundamental conventions of the International Labour Organisation (ILO) and international environmental treaties

In addition, I also undertake to adopt any environmental and social risk mitigation measures as defined in the environmental and social management plan or the notice of environmental and social impact issued by the Employer.

Dated this _____ day of _____20_____

Signature _____in the capacity of_____

duly authorized to sign Tenders for and on behalf of

_____[Name of Tenderer] of

_____[Address of Tenderer]

_____[Seal or Stamp of Tenderer]

FORM RB 1

REPUBLIC OF KENYA

PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

APPLICATION NO…….OF……..…20……...

BETWEEN

…….APPLICANT

AND

……RESPONDENT (Procuring Entity)

Request for review of the decision of the…… (Name of the Procuring Entity) of ……dated the…day of ……20…….in the matter of Tender No……..…of ……..20…

REQUEST FOR REVIEW

I/We……,the above named Applicant(s), of address: Physical address…….Fax No……Tel. No……..Email ……, hereby request the Public Procurement Administrative Review Board to review the whole/part of the above mentioned decision on the following grounds , namely:-

1.
2.
etc.

By this memorandum, the Applicant requests the Board for an order/orders that: -

1.
2.
etc

SIGNED ……..(Applicant)

Dated on……..day of ……../…20…

FOR OFFICIAL USE ONLY

Lodged with the Secretary Public Procurement Administrative Review Board on …… day of ……...20……

SIGNED
Board Secretary

DECLARATION FORM

Date _____

To _____

_____

_____

The tenderer i.e. (Name and address)_____

_____declare the following:

a) Has not been debarred from participating in public procurement.

b) Has not been involved in and will not be involved in corrupt and fraudulent practices regarding public procurement.

_____	_____	_____
Title	Signature	Date

(To be signed by authorized representative and officially stamped)

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BILL 01: PRELIMINARY AND GENERAL ITEMS

Scope:

This bill comprises those items that are required at the Commencement and Completion of the Works or that are Provisional Items applicable for the duration of the Works.

01-50- 001 Mobilization and Establishment of the Site

The Contractor shall provide all equipment, tools, materials, temporary offices, stores and housing required to carry out the Works.

The Contractor shall ensure that all possible means of protection are given to the labour force at all times. Such protection shall include provision of high visibility clothing or vests, goggles and masks for workers in potentially dangerous locations or dealing with potentially harmful materials. The Contractor shall also maintain first aid kits with a minimum of the following items:-

- Non Stick wound dressing
- Selection of plaster/band aids
- Crepe bandages
- Gauze and cotton wool
- Antiseptic solution (washing wounds)
- Antiseptic cream – Betadine, Burnol
- Pain killers Panadol, Disprin
- Anti diarrhoea – Immodium, Diadis, Charcoal
- Anti histamine – Piriton, Triludan
- Anti nausea – Stemetil
- Eye ointment
- Oral re-hydration sachets
- Surgical gloves

Measurement and Payment: NA

01-60- 001 Contract Supervision

Provisional sum available for the Engineer for expenses incurred for supervising the contract such as allowances, casual wages and transportation within the project area.

Measurement and Payment:

Provisional Sum: Payable by the Contractor to the Engineer through certification as directed by the Engineer. No mark up is included in this item.

Work Method: NA

01-60- 002 Clearance on Completion

On Completion of the Works, all temporary housing, equipment, signs and tools shall be removed from the site, and the site left in good order to the satisfaction of the Engineer.

Measurement and Payment

The Lump Sum payment will be made upon approval by the Engineer that the Clearance has been satisfactorily carried out.

Work Method: NA

01-60-003 Insurance

The Contractor shall provide Insurance in accordance with the Conditions of Contract as indicated in the

Appendix to form of tender for Rehabilitation and Improvement Contracts and Clause 14.1 for small works conditions of contract.

Measurement and Payment

Lump Sum payment for this item will be made upon the production of satisfactory evidence by the Contractor that Insurances have been affected.

Work Method: NA

01-60-004 Quality Control Tests

The Engineer may instruct the Contractor during the progress of the Works to carry out quality control tests to check materials and standards of workmanship, against the Specifications.

Where such tests indicate defective standards the Engineer shall instruct the Contractor to rectify the defects to the Engineer's satisfaction and at the Contractor's expense.

The Engineer shall include a Provisional Sum for this item to be expended only as and when the Contractor is instructed to carry out tests at approved material testing laboratories.

Measurement and Payment

Reimbursable item based on actual costs incurred by the contractor including sampling, transportation and testing.

Work Method: NA

01-60-005 Publicity Sign Boards

The Contractor shall provide Sign Boards as specified on the Drawings or as directed by the Engineer. The Sign Boards shall be placed at the beginning and end of the road or road bill covered by this Contract.

Sign Boards shall be maintained for the duration of the Works, and removed on completion.

Quality Control

The Engineer shall check that Sign Boards have been erected in accordance with Drawings and Specifications.

Measurement: Number

The unit of measurement shall be number of Sign Boards erected

Payment

The unit rate shall be the full compensation for labour, tools, materials and incidental costs required for carrying out the work.

Work Method: NA

01-60- 006 Drinking Water

The Contractor shall provide safe drinking water on site for workers at a reasonable distance from all work locations, for the duration of the Works.

Quality Control

The Engineer shall check regularly that adequate supplies of water are available throughout the Site.

Measurement and Payment

A Lump Sum shall be paid on a Monthly basis upon the approval of the Engineer that adequate supplies have been provided.

Work Method: **LB**

01-60-007 Provision of site sanitation facilities

The Contractor shall provide sanitation facilities on site for workers at a reasonable distance from all work locations, for the duration of the Works. This can be in the form of shallow pit latrines that are appropriately covered. All shallow pit latrines shall be filled in after the end of use.

Quality Control

The Engineer shall check regularly that adequate sanitation facilities are available throughout the Site.

Measurement and Payment

A Lump Sum shall be paid on a Monthly basis upon the approval of the Engineer that adequate sanitation facilities have been provided.

Work Method: **LB**

BILL 08: CULVERT AND DRAINAGE WORKS

This bill covers all Works in connection with the installation of concrete pipe culverts; inlet and outlet structures; drifts and drainage protection Works; and the construction of Scour Checks

08-50-002: Ditch Cleaning

i Partially silted

Partially silted drains are those that are less than half silted and require only cleaning.

All deposited material, debris, and vegetation shall be removed and the drain shaped to the original cross section and left in a free-draining condition. Suitable material may be used to fill depressions and potholes on the carriageway. All debris and other unsuitable material removed from the side drains shall be disposed of well clear of the drainage system in approved spoil dumps where it will not cause any obstruction or be washed back.

The side drains, mitre drains and catch water drains shall be cleaned before the onset of the rains or as directed by the Engineer.

This activity shall be carried out either as Machine Based, Labour Based or a mixture of the two as defined in the Bills of Quantity or as instructed by the Engineer.

Work Method: **LB, MB, LB-MB**

Quality Control

- Appropriate drain templates shall be used to check and control the dimensions of the drains.
- The longitudinal profile of the drains shall be checked using boning rods, to ensure free flow.

Measurement Unit: m

The measurement shall be the length of drain desilted or cleaned to the specified cross section.

Payment

The unit rate shall be full compensation, for labour, tools, and incidental costs required to carry out the work.

ii Fully silted

Fully silted drains shall be those that are greater than half-silted and require re-excavation or reshaping.

All deposited material, debris, and vegetation shall be removed and the drain shaped to the original cross section and left in a free-draining condition. Suitable material may be used to fill depressions and potholes on the carriageway. All debris and other unsuitable material removed from the side drains shall be disposed of well clear of the drainage system in approved spoil dumps where it will not cause any obstruction or be washed back.

The side drains shall be desilted or re-excavated before the onset of the rains, or as directed by the Engineer.

This activity shall be carried out either as Machine Based, Labour Based or a mixture of the two as defined in the Bills of Quantity or as instructed by the Engineer.

Work Method: **LB, MB, LB-MB**

Quality Control

- Appropriate drain templates shall be used to check and control the dimensions of the drains.
- The longitudinal profile of the drains shall be checked using boning rods, to ensure free flow.

Measurement Unit: m

The measurement shall be the length of drain re-excavated or re-shaped to the specified cross-section.

Payment

The unit rate shall be full compensation for equipment, labour, tools, and any incidental costs required to carry out the work.

08-50-003: Ditch Works earth fills.

This activity involves the reinstatement/protection works of culvert outlets by filling the resultant eroded ditch gullies with specified suitable soft material to ensure free passage of water at all times without causing further damage. The ditch shall be excavated to firm ground and shaped to the required suitable shape (depth, width, levelled and smoothened) to the satisfaction of the engineer prior to filling. The fill material shall be deposited in layers as directed by the Engineer.

The filling shall be carried with approved soft material and compacted in layers not exceeding 150 mm loose depth or in thickness that shall not exceed the maximum that the equipment and method of operation can process to meet the required compaction as directed by the Engineer.

The Contractor shall first reshape the eroded ditch gullies to suitable shapes for working, remove any unsuitable materials, supply, dump, spread and process and compact in accordance with Section 508 of the Standard Specifications or as instructed by the engineer.

Work Method: LB-MB

Quality Control:

The Engineer shall approve the borrow materials, measure the volume of the borrow fill materials, the compaction achieved of each layer and the gradient of the out fall to avoid further erosion.

Measurement Unit: m^3

The measurement shall be the volume of the fill material excavated, transported and deposited to fill the ditch gullies.

Payment:

The unit rate shall be the full compensation for all labour, materials, tools, equipment and incidental costs required to complete the work.

08-50-004: Ditch Works rock fills. Supply and fill

This activity involves the reinstatement/protection works of culvert outlets by filling the resultant eroded ditch gullies with specified suitable hard material to ensure free passage of water at all times without causing further damage. The ditch shall be excavated to firm ground and shaped to the required suitable shape (depth, width, levelled and smoothened) to the satisfaction of the engineer prior to filling. The fill material shall be deposited in layers as directed by the Engineer.

The filling shall be carried with approved hard material and compacted in layers not exceeding 150 mm loose depth and systematically compacted by at least 8 passes of a towed vibrating roller weighing not less than 5 tonnes dead weight or in thickness that shall not exceed the maximum that the equipment and method of operation can process to meet the required compaction as directed by the Engineer. During compaction the surface of the layer shall be watered as necessary to facilitate the filling of the voids with the blinding material.

The Contractor shall first reshape the eroded ditch gullies to suitable shapes for working, remove any unsuitable materials, supply, dump, spread and process and compact in accordance with Section 508 of the Standard Specifications or as instructed by the engineer.

Work Method: **LB-MB**

Quality Control:

The Engineer shall approve and measure the volume of the hard materials, the compaction achieved of each layer and the gradient of the out fall to avoid further erosion.

Measurement Unit: m^3

The measurement shall be the volume of the hard material excavated, transported and deposited to fill the ditch gullies to the desired level.

Payment:

The unit rate shall be the full compensation for all labour, materials, tools, equipment and incidental costs required to complete the work.

08-50-005: Ditch/Mitre Drains/Catch water Drains

The Contractor shall excavate side drains, mitre drains and catch water drains to the dimensions shown on the Drawings and at locations as directed by the Engineer. They shall be excavated in a manner to minimise erosion at the discharge point. The material excavated from the drains shall be used to form the side drain bund directing water to the mitre-drain, and a bund on the lower side of the cut-off drain, or used for forming camber or disposed of as directed by the Engineer.

This activity shall be carried out either as Machine Based, Labour Based or a mixture of the two as defined in the Bills of Quantity or as instructed by the Engineer.

Work Method: ***LB, MB, LB-MB***

Quality Control

- The longitudinal profile shall have a gradient of maximum 4%.
- The dimensions of the drains shall have maximum tolerances of ±20mm
- The location of the drains shall be approved by the Engineer.

Measurement Unit: m^3

The measurement shall be the volume of material excavated as measured on site in approved drains.

Payment

The unit rate shall be full compensation for labour, tools, equipment and incidental costs required for

carrying out the work.

08-50-06 Open lined drain cleaning
08-50-07 Open lined drain repairs
08-50-08 Covered (slotted) lined drain construction
08-50-09 Covered (slotted) lined drains cleaning
08-50-10 Covered (slotted) lined drains cleaning
08-50-11 Construction of a canalised drain (RC)
08-50-12 Cleaning of canalised drain (RC)
08-50-13 Canalised drain repairs
08-50-14 Lay drain lining
08-50-15 Gulley pot construction
08-50-16 Gulley pot cleaning
08-50-17 Gulley pot repairs
08-50-18 Gulley pot covers replacement
08-50-19 Gulley pot frames replacement
08-50-20 Open drain construction (half round)
08-50-21 Open drain (half round) repairs/replacement
08-50-22 Laying of side slabs
08-50-23 Repair of side slabs
08-50-24 Manhole construction
08-50-25 Manhole cleaning
08-50-26 Manhole repairs
08-50-27 Replacement of manholes chamber rings
08-50-28 Replacing concrete haunching
08-50-29 Replacement of manhole cover frames
08-50-30 Manhole covers construction/replacement
08-50-31 Manhole covers repairs

These activities should be done in accordance with the Draft Urban Roads Design Manual

The activities shall be carried out either as mainly Labour Based or a mixture of the two as defined in the Bills of Quantity or as instructed by the Engineer.

Work Method: ***LB-MB***

Quality Control

- The longitudinal profile shall have a gradient of maximum 4%.
- The location of the drains shall be approved by the Engineer.

Measurement Unit: No or m

The measurement shall be the number or length laid of items used as measured and approved on site by the engineer.

Payment

The unit rate shall be full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

08-60-001/005: Culvert Cleaning (partially blocked)

08-60-001 300mm dia
08-60-002 450mm dia
08-60-003 600mm dia
08-60-004 900mm dia
08-60-005 1200 mm dia

This activity involves the cleaning of culverts of specified sizes including pipe barrels, the outlet/inlet structures, and the outlet drains, keeping them free of all debris, weed, silt and any obstruction to ensure free passage of water at all times. The debris shall be deposited in approved spoil dumps as directed by the Engineer

Partially blocked culverts shall be those with less than half of the barrel blocked.

Correct widths and slopes of the outlet drains shall be maintained. The gradient of the outlet drain shall be not less than 2 %.

All broken culvert barrels discovered in the course carrying out this activity shall be reported to the Engineer.

This activity shall be carried out before the rains, or as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item of work

Work Method: **LB**

Quality Control

The culverts shall be checked as free of debris to the satisfaction of the Engineer.

Measurement Unit: **m**

The measurement shall be the length of culvert, including the outlet drain, cleaned

Payment

The unit rate shall be full compensation for labour, tools and incidental costs required to carry out the work.

08-60-006/7/8/9/10: Culvert Cleaning (Fully blocked):

08 - 60 - 006 300mm dia;
08 - 60 - 007 450mm dia;
08 - 60 - 008 600mm dia;
08 - 60 - 009 900mm dia;
08 - 60 - 010 1200mm dia

This activity involves the cleaning of culverts of specified sizes including pipe barrels, the outlet/inlet structures, and the outlet drains, keeping them free of all debris, weed, silt and any obstruction to ensure free passage of water at all times. The debris shall be deposited in approved spoil dumps as directed by the Engineer

Fully blocked culvert shall be those with greater than half of the barrel blocked.

Correct widths and slopes of the outlet drains shall be maintained. The gradient of the outlet drain shall be not less than 2 %.

All broken culvert barrels discovered in the course of carrying out this activity shall be reported to the Engineer.

This activity should be carried out before the onset of the rains, or as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item of work.

Work Method: **LB**

Quality Control

The culverts shall be checked as free from debris, to the satisfaction of the Engineer.

Measurement Unit: m

The measurement shall be the length of culvert, including the outlet drain cleaned.

Payment

The unit rate shall be full compensation for labour, tools and incidental costs required to carry out the work.

08-60-011/015 Concrete Culvert Repair / Replacement – Rings

08-60-11	300 mm
08-60-12	450 mm
08-60-13	600 mm
08-60-14	900 mm
08-60-15	1200 mm

The Contractor shall supply, lay and join concrete pipes to replace damaged culvert rings, including the concrete bedding and backfilling as instructed by the engineer.

The pipes shall be of Class 20/20 concrete, at least 28 days cured, and manufactured on site or procured from a supplier approved by the Engineer. The pipes shall be laid on a bedding of Class 15/20 concrete.

The culvert ring shall follow the existing gradient and shall be free flowing – minimum 2%.

Backfilling shall be carried with approved material and compacted in layers not exceeding 150 mm loose depth and placed evenly on each side of the pipe. Ramps shall be shaped to achieve a minimum overfill of 75% of the pipe diameter, and shall be tapered back on the carriageway to provide a gradual approach, as directed by the Engineer.

On completion the inside of the culvert shall be smooth, without displaced joints or other obstructions and true to line and level.

The Contractor shall use **Labour** and appropriate compaction **Equipment** to carry out this item work

Work Method: **LB-MB**

Quality Control

- Concrete quality shall be checked for cracks, honey combing, and other defects.
- Before the pipes are laid, the gradient of the concrete bedding shall be checked and shall not be less than 2%
- The joints shall be checked to see that they have been properly made.

Measurement Unit: m

The measurement shall be in linear metres of the installed Type and size of culvert specified, measured net according to the Drawings.

Payment

The unit rate shall be the full compensation for labour, tools, materials, equipment and any other incidentals that may be required in carrying out the work.

08-60-016
08-60-021/029 Supply and Installation of Concrete Pipe Culverts

08-60-016	**300**	**mm**	**unhaunched**
08-60-021	**300**	**mm**	**surrounds**
08-60-022	**450**	**mm**	**unhaunched**
08-60-023	**450**	**mm**	**surrounds**
08-60-024	**600**	**mm**	**unhaunched**
08-60-025	**600**	**mm**	**surrounds**
08-60-026	**900**	**mm**	**unhaunched**
08-60-027	**900**	**mm**	**surrounds**
08-60-028	**1200**	**mm**	**unhaunched**
08-60-029	**1200**	**mm**	**surrounds**

The Contractor shall supply, lay and join concrete pipes to form culverts, including the concrete bedding; haunching or surrounds; and backfilling, in accordance with the Drawings for the Type and diameter specified in the Contract or directed by the Engineer.

The pipes shall be of Class 20/20 concrete, at least 28 days cured, and manufactured on site or procured from a supplier approved by the Engineer and preferably ogee jointed. The pipes shall be laid on a bedding of Class 15/20 concrete of dimensions as shown on the Drawings and jointed with cement mortar 1:4.

The culvert gradient including the outlet shall be a minimum 2%.

The pipes shall be surrounded with Class 15/20 concrete to the dimensions shown on the Drawings or as directed by the Engineer.

Backfilling shall be carried with approved material and compacted in layers not exceeding 150 mm loose depth and placed evenly on each side of the pipe. Ramps shall be shaped to achieve a minimum overfill of 75% of the pipe diameter, and shall be tapered back on the carriageway to provide a gradual approach, as directed by the Engineer.

If the Contractor wishes to construct culverts on site, using inflatable or collapsible forms the Engineer's approval shall first be sought for the proposed working method.

On completion the inside of the culvert shall be smooth, without displaced joints or other obstructions and true to line and level.

The Contractor shall use **Labour** and appropriate compaction **Equipment** to carry out this item work

Work Method: **LM-MB**

Quality Control

- Concrete quality shall be checked for cracks, honey combing, and other defects.
- Before the pipes are laid, the gradient of the concrete bedding shall be checked and shall not be less than 2%
- The joints shall be checked to see that they have been properly made.

Measurement Unit: m

The measurement shall be in linear metres of the installed Type and size of culvert specified, measured net according to the Drawings.

Payment

The unit rate shall be the full compensation for labour, tools, materials, equipment and any other incidentals that may be required in carrying out the work.

08- 60-017 Head Wall Repair - Masonry

This activity involves the repairs to damaged head walls and wing walls built in masonry.

Where directed by the Engineer, the masonry walls shall be inspected and loose or missing stone re-secured or replaced. Damaged pointing shall be repaired with cement mortar 1:4 and finished flush with the stonework.

The Contractor shall use **Labour** to carry out this item of work

Work Method: **LB**

Quality Control

- The stability of the walls and the pointing shall be to the satisfaction of the Engineer.

Measurement Unit: No

The measurement shall be the number of walls repaired as directed by the Engineer.

Payment

The unit rate shall be full compensation for labour, materials, tools, and incidental costs required to carry out the work.

08-60-018 Headwall Repair - Concrete

The activity involves the repairs to damaged concrete headwalls and wing walls, and to inlet/outlet concrete aprons. Concrete walls shall be inspected and repair works carried out as instructed by the Engineer to include breaking out and replacement of damaged concrete with similar material, and the rendering of open texture areas with cement mortar 1:4. Broken wall sections shall be re-built in 20/20 (1:2:4) concrete within formwork erected on the correct lines and levels in accordance with the Standard Drawings. Areas of new concrete and mortar shall be protected from direct sunlight and kept moist for 3 days.

The Contractor shall use **Labour** to carry out this item of work

Work Method: **LB**

Quality Control

The work shall be carried out to the satisfaction of the Engineer.

Measurement Unit: No

The measurement shall be the number of walls/aprons repaired.

Payment

The unit shall be full compensation for labour, materials, tools, and incidental costs required to carry out the work.

08-60-019 Headwall Construction - Masonry

The Contractor shall construct inlet and outlet structures for culverts including headwalls, wingwalls in stone masonry or concrete block, and aprons in concrete to the dimensions and levels shown on the Drawings (Types 1 to 4) as directed by the Engineer. The walls shall be built on foundations of class 15/20 concrete and jointed with cement mortar 1:4. The aprons shall be in Class 20/20 concrete and after laying the surface shall be kept moist for 3 days.

The Contractor shall use **Labour** to carry out this item.

Work Method: ***LB-MB***

Quality Control

- The dimensions of the structures shall have a tolerance of $\pm$10mm
- The levels shall have a tolerance of $\pm$10mm
- The mortar joints shall be finished flush with the face of the walls.

Measurement Unit: m^3

EA

The measurement shall be the volume of the structures constructed, in whichever material, measured net according to the Drawings.

Payment

The unit rate shall be the full compensation for labour, tools, materials and any other incidentals that may be required in carrying out the work.

08-60-020 Headwall Construction – Concrete

The Contractor shall construct inlet and outlet structures for culverts in concrete to the dimensions and

levels shown on the Drawings (Type 1 to 4) as directed by the Engineer.

Concrete shall be Class 20/20 unless otherwise specified. The formwork for the walls shall be erected on the concrete foundations, to the correct dimensions, and shall be approved by the Engineer before concrete is poured. Concrete shall be poured in a single lift and the top surface shall be kept moist for 3 days. Formwork may be struck after 2 days or as directed by the Engineer.

The Contractor shall use a concrete vibrator or other means approved by the Engineer to ensure full compaction of the concrete.

The Contractor shall use both **Labour** and appropriate **Equipment** to carry out this item.

Work Method: ***LM-MB***

Quality Control

- The dimensions of the structures shall have a maximum tolerance of + 20mm / - 10mm
- The workability and mix of concrete shall be checked using the slump test and shall have a slump limit as directed by the Engineer. The frequency of testing shall be determined by the Engineer
- The concrete shall be checked for cracks, honey combing and other defects at the time of striking the formwork.

Measurement Unit: m^3

The measurement shall be the volume of concrete in the completed structure, measured net in accordance with the Drawings.

Payment

The unit rate shall be the full compensation for labour, tools, materials, formwork, equipment and other incidentals that may be required in carrying out the work.

08-60-030 Excavate in soft material for culverts
08-60-031 Excavate in hard, material for culverts
08-60-032 Provide, lay and join 450mm inner dia. Concrete pipes
08-60-033 Provide, lay and join 600mm inner dia. Concrete pipes
08-60-034 Provide, lay and join 900mm inner dia. Concrete pipes
08-60-035 Provide, compact class 15/20 concrete
08-60-036 Provide, compact class 20/25 concrete
08-60-037 Provide and place A142 fabric mesh reinforcement
08-60-038 Selected backfill materials

These activities should be done in accordance with Bill 8, sub clauses 8.01 to 8.20 in the Standard Specifications for Roads and Bridges 1986.

The Contractor shall use both **Labour** and appropriate **Equipment** to carry out this item.

Work Method: ***LM-MB***

Quality Control

- The workability and mix of concrete for the classes 15/20 and 20/25 shall be checked using the slump test and shall have a slump limit as directed by the Engineer.
- The laying and joining of the culverts shall be subject to the approval of the engineer.

Measurement Unit: m

The measurement shall be the length of culvert laid.

Payment

The unit rate shall be the full compensation for labour, tools, materials, formwork, equipment and other incidentals that may be required in carrying out the work.

08-60-039 Cascades Construction (Concrete)
08-60-040 Cascades Construction (Masonry))
08-60-041 Cascades Repair/Replacement (Concrete)
08-60-042 Cascades Repair/Replacement (Masonry)

These activities should be done in accordance with the Draft Urban Roads Design Manual

The Contractor shall use **Labour and Machinery** to carry out this item.

Work Method: ***LB -MB***

Quality Control

- The construction/repairs/replacement shall be done to the satisfaction and approval of the engineer

Measurement Unit: No

The measurement shall be the number of cascades constructed, repaired or replaced.

Payment

The unit rate shall be the full compensation for labour, tools, materials, formwork, equipment and other incidentals that may be required in carrying out the work.

08-70-001: Stone Pitching

The Contractor shall lay stone pitching at locations shown on the Drawings or as directed by the Engineer, which shall include levelling the area to be covered with stone pitching, collecting stones, laying stones, applying mortar to the joints and constructing weep holes, if required.

The area to be covered with stone pitching shall be trimmed to the level and slope shown on the Drawings or as directed by the Engineer. The prepared surface shall be firm and well compacted, with hand rammers.

The stones shall have minimum dimensions of 150mm and maximum 300mm and shall be set on the flat side and securely bedded, with the largest dimensions at right angles to the flow of water, in an interlocking pattern so as to leave only a minimum of voids between the stones which shall be filled with suitably shaped and tightly wedged spalls. The top of the pitching shall be finished flush with the adjacent material.

The stones shall be placed in full contact with the surface and bedded into cement mortar 1:4 with a minimum thickness of 100 mm. The mortar shall be worked into the pitching so that the voids between the stones are filled to the full depth of the pitching. The mortar shall be finished flush with the surface of the stones.

Weep holes shall be provided to stone pitching on slopes as directed by the Engineer.

The surface of the stone pitching shall be protected from direct sunshine and kept moist for 2 days.

The Contractor shall use **Labour** to carry out this item.

Work Method: **LB**

Quality Control

EB

- The quality of pitching shall be checked for gaps and voids.
- The dimensions of the area of stone pitching shall have a tolerance of ±100mm

Measurement Unit: m^2

The measurement shall be the total area of pitching calculated as the net area, measured on the slope.

Payment

The unit rate shall be full compensation, for labour, tools, materials, and incidental costs required for carrying out the work.

08-70-002: Stone Pitching Repair

This activity involves the repair of stone pitching on slopes, in inlet/outlet aprons and access drifts. The stone pitching shall be inspected and repairs carried out as directed by the Engineer, including the replacement and re-bedding of missing or loose stones; the repair of mortar jointing: and the cleaning out of weep holes, as required. All work shall be to the lines and levels of the original construction with new stonework and mortar being flush with the adjacent materials.

The Contractor shall use **Labour** to carry out this work

Work Method: **LB**

Quality Control

The work shall be carried out to the satisfaction of the Engineer.

Measurement Unit: m^2

The measurement shall be the net surface area of the repairs.

Payment

The unit rate shall be full compensation, for labour, tools, materials, and incidental costs required to carry out the work.

08-70-003: Gabion Repair

The Contractor shall repair installed Gabions using 3 mm galvanized binding wire to its original dimensions as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item.

Work Method: **LB**

Quality Control

The repair of the Gabions shall be approved by the Engineer.

Measurement Unit: No

The measurement shall be the number of Gabion boxes repaired/installed.

Payment

The unit rate shall be the full compensation for labour, materials, and any incidental item costs necessary to carry out the work.

08-70-004: Gabion Installation

The Contractor shall provide and install Gabions as retaining walls and anti-erosion structures at locations shown on the Drawings or as directed by the Engineer.

Gabions shall include mattresses and boxes and for purposes of construction, measurement and payment, no distinction shall be made between them.

Gabions shall be 'Maccaferi" boxes or 'Reno' matresses or equivalent approved by the Engineer.

The surfaces on which the Gabions are to be laid prior to being filled with rock shall be levelled to the depths and dimensions shown on the Drawings or as directed by the Engineer.

Gabion boxes shall be tied together with 3 mm galvanised binding wire securing all edges at 150mm intervals.

The Contractor shall use **Labour** to carry out this item.

Work Method: **LB**

Quality Control

The placing and tying of the Gabions shall be approved by the Engineer before filling commences.

Measurement Unit: No

The measurement shall be the number of Gabion boxes installed.

Payment

The unit rate shall be the full compensation for labour, materials, and any incidental item costs necessary to carry out the work.

08-70-005: Rock fill to Gabions

The Contractor shall provide selected rock, crushed if necessary, and carry out the packing and compacting of the rock inside the Gabion boxes.

The boxes shall be filled in layers from the sides towards the middle in an interlocking stone matrix to prevent deformation and bulging. The interior and top layers of the boxes shall be hand packed with smaller stone to form a tightly compact structure and rammed in place. Care shall be taken to ensure that each layer of boxes is filled evenly and to a level surface before the next course of boxes is placed.

The Contractor shall use a combination of **Labour** and transport **Equipment** to carry out this activity.

Work method: **LB-MB**

EC

Quality Control

The filling and compaction of the stones in the Gabion boxes shall be approved by the Engineer.

Measurement Unit m^3

Rock fill to Gabions shall be the volume of Gabions filled.

Payment

The unit rate shall be the full compensation for labour, tools, materials and incidental costs required for carrying out the work.

08-70-006: Construction of Scour Checks (Concrete)
08-70-007: Construction of Scour Checks (Masonry)
08-70-008: Construction of Scour Checks (Wooden Stakes)

The Contractor shall construct scour checks using either stones, wooden stakes, or concrete as instructed by the Engineer.

Construction of concrete scour checks shall be in class 20/20 concrete, unless otherwise specified, and to the details shown in the Drawings.

Spacing for scour checks shall be as shown in Table 8.1, or as directed by the Engineer.

Table 8.1 : Scour checks spacing

Gradient of Drain	Scour Check Spacing	Gradient of Drain	Scour Check Spacing
4% or less	not required	8%	7.5m
5%	20m	9%	6m
6%	15m	10%	5m
7%	10m	>10%	4m

The Contractor shall use **Labour** to carry out this item.

Work method: ***LB***

Quality Control

The spacing of the scour checks shall have a tolerance of ± 0.5m
The sizes of the wooden stakes and stones used shall be in accordance with the Drawings
The shape of the scour check shall be checked using the scour check template.

Measurement Unit: No.

The measurement shall be the **number** of scour checks constructed.

Payment

The unit rate shall be full compensation, for labour, tools, materials and incidental costs required for carrying out the work.

08-70-009: Scour Check Repair - masonry
08-70-010: Scour Check Repair - wooden
08-70-011: Scour Check Repair - concrete

This activity involves the repair of Scour Checks using stones or wooden stakes or concrete. The construction details shall be shown in the Drawings or as instructed by the Engineer.

Scour checks shall be inspected and the repairs carried out as directed by the Engineer, which shall include replacement of missing or broken stonework and stakes; and the repair of damaged concrete, to the original lines, levels, and Specifications.

The Contractor shall use **Labour** to carry out this item work.

Work Method: ***LB***

Quality Control

ED

The sizes of the wooden stakes and stones used shall be as the original construction.
The shape of the scour check shall be checked using the scour check template.
Measurement: No.

The unit rate of measurement shall be the number of scour checks repaired.

Payment

The unit rate shall be full compensation, for labour, tools, materials, and incidental costs required for carrying out the work.

08-70-012 At-level Scour Checks

The Contractor shall select and place flat stones of minimum dimensions 0.10-0.15m in gently sloping channels (parabolic waterway) at locations and intervals as shown in drawing C9c. The stones shall be placed in a manner to ensure minimum voids within the structure. A trench 0.2m deep by 0.2m wide shall be excavated in the invert of the channel and extended 0.2m into the slopes. Stones shall be laid up to the level of the invert with the middle section lower than the sides to form a spill way. The spacing of the checks shall be 1-4 metres, as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item.

Work Method: **LB**

Quality Control

The construction and spacing of the scour checks shall be checked by the Engineer.

Measurement Unit: No

The measurement shall be the number of scour checks constructed.

Payment

The unit rate shall be full compensation for labour, tools, materials and incidental costs required to carry out the work.
The payment for the construction of the parabolic waterway is under item 08-50-005

08-80-013 Gully – head protection - Stone Chute Stabilisation
08-80-014 Gully – head protection - Stone and Post Chute Stabilisation

The Contractor shall construct gully-head protection works as directed by the Engineer to the dimensions and details shown on Drawings C9d.

The dimensions of the stones shall not be less than 200mm and the volume not less than 0.01m^3 for the smaller stones and pebbles to be used as the transition layer between the stone structure and the ground. No rounded stones shall be used. Posts shall be durable hardwood minimum 900mm in length and 15mm diameter.

The gully head shall be excavated as shown on Drawings to form a firm base for the stone layers. The initial layer shall be the small stones and gravel to a depth of 150mm after which the larger stone shall be carefully placed to form a compact matrix. Posts shall be driven a minimum of 600mm into the ground at spacing as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item

Work Method: **LB**

Quality Control

The stone dimensions and construction shall be checked by the Engineer.

Measurement Unit: No

The measurement shall be number of units constructed

Payment

The unit rate shall be full compensation for labour, tools, materials and incidental costs required to carry out the work.

08-80-015 Stone Check Dams
08-80-016 Stone and Post Check Dams

The Contractor shall construct check dams in erosion gullies to the dimensions and details shown on Drawing C9e and/or as directed by the Engineer.

The dimensions of the stones in the main structure shall not be less than 200mm and the volume not less than 0.01 m^3 for the stones and pebbles for the transition layer between the stone structure and the ground. No rounded stones shall be used.

Posts shall be durable treated hardwood of minimum diameter 0.10m, of minimum length 1.6m, driven at least 600mm into the ground. Stones shall be carefully hand-packed to provide a stable structure with a minimum of voids.

The dam checks shall be constructed such that the top of the dam is lower than the level of the adjacent land to leave sufficient channel for water flow, the crest of the check dam is parabolic in shape forming the spillway and it is keyed into the excavation of the gully floor and into the sides of the gully. The gully floor below the check dam must be protected from erosion by an apron with parabolic shape protecting the sides of the channel. The posts must be hammered into the ground to a depth equal to the post height above the ground or a minimum of 0.6 m.

The spacing of the check dams shall be as shown in the table below:

Check Dam Spacing					
Gradient	**Height of dam spill way (m)**				
%	**0.15**	**0.25**	**0.50**	**0.75**	**1.00**
5	15.0	25.0			
7	5.0	8.7	17.5	25	35
10	2.5	4.2	8.4	12.6	16.8
15	1.4	2.3	4.6	6.9	9.2
20	0.9	1.6	3.2	4.8	6.4
25		1.3	2.5	3.8	5.0
30		1.0	2.0	3.0	4.0
40			1.6	2.4	3.2
50			1.2	1.8	2.0

Work Method: **LB**

The Contractor shall use **Labour** to carry out this item

Quality Control

The Engineer shall check the workmanship and spacing of the check dams.

Measurement Unit: No

The measurement shall be the number of check dams constructed

Payment

The unit rate shall be full compensation for labour, tools, materials and incidental costs required to carry out the work.

08- 080-001 Access Drifts (Stone Pitching)

The Contractor shall construct Access drifts in grouted stone pitching to the dimensions as shown on drawing C18 or as directed by the Engineer. This shall include the provision of stone and the levelling of the areas to be covered.

The stone pitching for Access drifts shall comply with the requirement of 08–70-001 (stone pitching) with the addition of masonry toes at each end of the drift as shown on the Drawings.

The area to be covered shall be trimmed to the line and slope shown on the Drawings or as directed by the Engineer, and the prepared surface compacted with hand rammers or appropriate equipment.

The grouted stone pitching shall be covered with wet sacking or other approved cover for not less than 4 days after laying and shall not be subject to loading until adequate strength has been developed as instructed by the Engineer.

The Contractor shall use **Labour** and appropriate **Equipment** to carry out this item.

Work Method: **LB-MB**

Quality Control

i) Stone pitching quality shall be as for 08-70-001

Measurement Unit m^2

The measurement shall be the area of stone pitching, measured net according to the Drawings.

Payment

The unit rate shall be full compensation for labour, tools, materials, equipment and incidental costs required for carrying out the work.

BILL 10: GRADING AND GRAVELLING

Scope:

Grading covers the work of reinstating the road carriageway to the correct camber by removing the high points and filling gullies, corrugations, and wheel ruts to restore a smooth running surface.

Grading can either be done by labour (Manual Reshaping) or by Machine (Motorized grading or towed grading).

Manual reshaping is preferable where there is sufficient labour. For existing roads with side drains light manual reshaping should be used as defined in 10-50-004. Heavy manual reshaping should be used for roads that have deteriorated to such an extent that the drains and carriageway need to be re-instated. Heavy Manual Reshaping is defined under Bill 5 – Earth Works.

Light grading is carried out on good and fair roads as a maintenance activity while heavy grading is for re-establishing a road in poor or very poor condition.

Gravelling consists of the excavation; loading, hauling, dumping, spreading and compacting using approved equipment of gravel wearing course material on the formation of the road carriageway. Gravel shall include lateritic gravel, quartzitic gravel, calcareous gravel, decomposed rock, soft stone coral rag, clayey sand and crushed rock.

The material may be obtained from quarries, borrow pits or excavation in cuttings as directed by the Engineer. Gravel material shall conform to the requirement given in Table 10.1

Table 10.1: Requirement for Gravel Wearing Course

GRADING REQUIREMENTS	
Sieve (mm)	% by Weight Passing
40	100
28	95 – 100
20	85 – 100
14	65 – 100
10	55 – 100
5	35 – 92
2	23 – 77
1	18 – 62
0.425	14 – 50
0.075	10 – 40

For “Quarry Waste” gravel stones of maximum dimension 80mm may be permitted

PLASTICITY INDEX REQUIREMENTS PI		
Zone	Min	Max
WET: Mean annual rainfall > 500mm	5	20
DRY: Mean annual rainfall < 500mm	10	30

BEARING STRENGTH REQUIREMENTS		
Traffic Commercial VPD	CBR	DCP Equivalent mm/Blow
>15	20	11
<15	15	14
CBR at 95 % MDD, Modified AASHTO and 4 days soaking		
Lower quality material (CBR 15) may be accepted if no better material can be found		

The Engineer shall approve quarries and the extent of their exploitation. The possible quarries shall be shown to the Contractor prior to commencement of the Works. The Contractor shall be responsible for the acquisition of the quarry rights and shall conduct respective negotiations with landowners and affected communities.

Alternative sources of gravel material whose quality can be shown to be in compliance with the specification requirements may be used, with the approval of the Engineer. The Contractor is deemed to have included in his rates for the provision of the gravel material.

10-50-001: Heavy Grading without watering and compaction.

Heavy grading without watering and compaction shall only be done when there is sufficient moisture in the material and the material can be compacted by traffic.

The Contractor shall scarify the existing carriageway surface, cutting high spots and moving materials to fill potholes, corrugations and wheel ruts and reshape the surface to the specified camber, using a Motor grader unless otherwise directed by the Engineer. All loose rocks, roots and grasses shall be removed first and disposed of well clear of the drains.

Pegs 300 to 400mm long shall be placed at 20 m intervals to mark edge of the carriageway.

The material shall be graded toward the centre of the road starting from both edges until the specified camber is achieved. Suitable material from the side drains may be used as additional material. Any further material needed to achieve the correct camber shall be from an approved source.

No grading shall be carried out in dry conditions.

The Contractor shall use **Equipment** to carry out this item.

Work Method: **MB**

Quality Control

- The width of the carriageway shall be checked at every 50m intervals and have a tolerance of + 50mm or -20mm.
- The camber shall be checked with a camber board at 25m intervals and shall have a tolerance of $\pm$ 1%

Measurement Unit: m^2

The measurement shall be the area of carriageway graded, measured net according to the specified width and measured length graded.

Payment

The unit rate shall be the full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

10-50-002: Heavy Grading with watering and compaction.

The Contractor shall scarify the existing carriageway surface, cutting high spots and moving materials to fill potholes, corrugations and wheel ruts and reshape the surface to the specified camber, using a Motor grader unless otherwise directed by the Engineer. All loose rocks, roots and grasses shall be removed first and disposed of well clear of the drains.

Pegs 300 to 400mm long shall be placed at 20 m intervals to mark edge of the carriageway.

The material shall be bladed toward the centre of the road starting from both edges until the specified camber is achieved. Suitable material from the side drains may be used as additional material. Any further material needed to achieve the correct camber shall be from an approved source. Compaction shall be carried out using appropriate equipment approved by the Engineer, from the carriageway edges to the centerline in overlapping passes.

In order to achieve the desired compaction water shall be added in an even manner without transverse or longitudinal flow.

The Contractor shall use **Equipment** to carry out this item.

Work Method: **MB**

Quality Control

- The width of the carriageway shall be checked at every 50m intervals and have a tolerance of + 50mm or -20mm.
- The camber shall be checked with a camber board at 25m intervals and shall have a tolerance of ± 1%
- Longitudinal levels shall be checked with a straight edge of minimum 2.7 m length. Maximum tolerance of ± 10 mm.
- Compaction shall show no movement of material under the roller, minimum of 6 passes.
- Compaction test standard shall be 95% MDD (AASHTO T99)

Measurement Unit: m^2

The measurement shall be the area of carriageway graded, measured net according to the specified width and measured length graded.

Payment

The unit rate shall be the full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

10-50- 004: Carriageway Grading - Light Grading

Light grading shall only be done when there is sufficient moisture in the material. The Contractor shall grade the carriageway to control roughness and corrugations using either a Towed or a Motor grader. The width of the carriageway shall be as specified for the Road Class.

Pegs 200 to 300mm long shall be placed at 20 m intervals to mark edge of the carriageway

The material shall be bladed toward the centre of the road, starting from both edges, to the specified camber. Where instructed by the Engineer, suitable materials from the side drains may be used to fill potholes and gullies in the carriageway. Any further material needed to re-form the camber shall be from an approved source. Compaction shall be achieved using the wheels of the equipment, tracked evenly over the full surface, or by other approved means.

No grading shall be carried out in dry conditions.

The Contractor shall use **Equipment** to carry out this item.

Work Method: **MB**

Quality Control

- The width of the carriageway shall be checked at every 50m intervals and have a tolerance of +50mm or -20mm

- The camber shall be checked with a camber board at 25m intervals and shall have a tolerance of ± 1%
- Longitudinal levels shall be checked with a straight edge of minimum 2.7 m length. Maximum tolerance of ±10 mm.

Measurement Unit: m^2

The measurement shall be the area of carriageway graded, measured net according to the specified width and measured length graded.

Payment

The unit rate shall be the full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

10-50- 004:Light Manual Reshaping (Grub edge, fill gullies and Reshape carriageway)

This activity involves trimming the edge of the carriageway, grubbing grass from the carriageway filling gullies and ruts on the carriageway and reshaping of the camber of the road to the original standard and shape. No grass shall be grubbed from the shoulders, but it shall be cut to a maximum height of 50mm.

For earth roads materials from the side drains may be used to reshape the carriageway and fill gullies. Where additional suitable material is required to reinstate the camber to the required shape, this material shall be obtained from approved sources nearest to the final deposition area.

For gravel roads the gravel shall be obtained from the stacks placed at intervals along the road for this purpose if applicable.

The fill material shall be watered, mixed and compacted using suitable tampers to a finished level 25mm above the surrounding road surface.

This activity shall be carried out before and after the rains, or as directed by the Engineer.

The Contractor shall apply **Labour** methods to carry out this item.

Work Method: ***LB***

Quality Control

- The width of the carriageway including the shoulders shall be checked at 100m intervals with tolerance of +50mm or -20mm
- The camber shall be checked using camber board at 50m intervals and shall have a tolerance of $\pm$ 1%
- The quality of fill material shall be approved by the Engineer
- The minimum compaction to be applied to fill areas shall be such that no rammer imprint on the surface shall be seen.

Measurement Unit: m^2

The measurement shall be the area of carriageway shaped.

Payment

The unit rate shall be the full compensation for labour, tools and incidental costs required for carrying out the work.

10-60-001: Provide Gravel Wearing Course (Excavation, Free haul, spreading and Compaction of Gravel)

Excavation of Gravel

Gravel shall be excavated from quarries approved by the Engineer, and the Contractor shall inform the Engineer if the quality/availability of the gravel changes during the course of excavation.

Stones and boulders with one dimension greater than 80mm shall be removed from the excavated gravel and deposited outside the quarry at locations approved by the Engineer. Such stones and boulders may be reused in other parts of Works with the approval of the Engineer.

Excavation and loading shall normally be by labour unless, at the request of the Contractor, the Engineer allows the use of equipment.

The Contractor shall use **Labour** and/or **Equipment** to carry out this work, as directed by the Engineer.

Work Method: **LB or MB**

Quality Control:

- Oversize stones and boulders shall not be loaded for haulage to the road.
- Areas containing deleterious material shall not be excavated.

Free haul, spreading and Compaction of Gravel

Free haul involves the transportation of gravel material for the first 1.5 km from the quarry. The Contractor shall spread and compact gravel material, in a manner to ensure a uniform thickness of the layer across the full width of the carriageway and shaped to the specified camber. Spreading also includes the removal of any oversized stones or boulders, which cannot be broken down to the required size, to spoil dumps. Gravel shall be spread within 24 hours of off-loading.

Compaction of the gravel material shall be carried out from the carriageway edges to the centerline by overlapping passes of the compaction equipment. The number of passes shall be as directed by the Engineer dependent upon the equipment used and the material being compacted. Unless otherwise instructed the moisture content of the material shall be within $\pm$ 2% of optimum

Where additional moisture is required water shall be applied in an even manner and the rate of application shall be such that no transverse or longitudinal flows occur.

The Engineer may instruct the Contractor to carry out density tests on the compacted material to ensure that an acceptable standard has been achieved.

The Contractor shall use Equipment for haulage and **Labour** for spreading unless the Engineer instructs otherwise.

Work Method: **LB-MB**

Quality Control:

- The gravel surface width shall be checked at 100m intervals and shall have a tolerance of $\pm$50mm
- Trial holes shall be dug as directed by the Engineer to check the gravel thickness and shall have a tolerance of + 5mm / - 0mm
- The camber shall be checked at 50m intervals and the maximum tolerance shall be $\pm$1 %
- The longitudinal profile shall be checked after the compaction of each load to ensure a smooth surface with no corrugations or depressions, tolerance of $\pm$ 10mm.
- Compaction shall show no movement of material under the roller, minimum of 6 passes.
- Compaction test standard shall be 95% MDD (AASHTO T180)

Measurement Unit: m^3

The measurement shall be the volume of compacted gravel surfacing measured net according to the

Drawings and shall include the excavation and the 1.5km 'free' haul distance

Payment

The unit rate shall be the full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

10–60- 002: Haulage (Overhaul beyond 1.5km)

The Contractor shall haul by appropriate equipment and off-load on the road as directed by the Engineer. Where the quantity delivered in any load falls short of the equipment capacity, off-loading shall only be permitted after the agreed spacing is adjusted accordingly.

No vehicle with a capacity of greater than 10 tonnes shall be permitted to off-load gravel directly on the prepared formation unless approved by the Engineer. Any greater loads shall be dumped in stockpiles off-road and transported to the formation areas by appropriate means.

Where loads supplied are found to contain material other than from the approved quarry and are of unacceptable quality, the Contractor shall remove them from site at the Contractor's expense.

The Contractor shall use **Equipment** to carry out this Item.

Work Method: **MB**

Quality Control:

- No haulage equipment shall be used until its capacity has been ascertained by the Engineer
- The quality of gravel dumped on the road shall be according to the Specifications
- The quantity of material delivered in each load shall be checked before dumping is allowed
- The distance between the stacks shall be checked to ensure the required compacted thickness will be achieved.

Measurement Unit: m^3km (Overhaul)

The Contractor shall allow in the rates for item 10-60-001 for a 'free' haul distance of 1.5km. The 'overhaul' shall be the distance, greater than 1.5km, to the centre point of the section where the gravel is being dumped and processed, measured along the shortest route as determined by the Engineer.

The measurement of overhaul shall be the product of the volume of the gravel hauled and the distance to the centre point as indicated above.

Payment

The unit rate shall include full compensation for labour, tools, equipment, and incidental costs necessary to carry out the work.

10-60-004Gravel Patching (Excavation, Free haul, Spreading and Compaction of Gravel)

Excavation of Gravel

Gravel shall be excavated from quarries approved by the Engineer, and the Contractor shall inform the Engineer if the quality/availability of the gravel changes during the course of excavation.

Stones and boulders with one dimension greater than 80mm shall be removed from the excavated gravel and deposited outside the quarry at locations approved by the Engineer. Such stones and boulders may be reused in other parts of Works with the approval of the Engineer.

Excavation and loading shall normally be by labour unless, at the request of the Contractor, the Engineer allows the use of equipment.

The Contractor shall use **Labour** and/or **Equipment** to carry out this work, as directed by the Engineer.

Work Method: **LB or MB**

Quality Control:

- Oversize stones and boulders shall not be loaded for haulage to the road.
- Areas containing deleterious material shall not be excavated.

Free haul, preparation, spreading and Compaction of Gravel

Free haul involves the transportation of gravel material for the first 1.5 km from the quarry. The Contractor shall prepare the area to be patched by removing excessive water and loose material. The contractor shall then dump, spread and compact gravel material, in a manner to ensure a uniform thickness of the layer across the full width of the carriageway and shaped to the specified camber. Spreading also includes the removal of any oversized stones or boulders, which cannot be broken down to the required size, to spoil dumps. Gravel shall be spread within 24 hours of off-loading.

Compaction of the gravel material shall be carried by overlapping passes of the compaction equipment. The number of passes shall be as directed by the Engineer dependent upon the equipment used and the material being compacted. Unless otherwise instructed the moisture content of the material shall be within $\pm$ 2% of optimum

Where additional moisture is required water shall be applied in an even manner and the rate of application shall be such that no transverse or longitudinal flows occur.

The Engineer may instruct the Contractor to carry out density tests on the compacted material to ensure that an acceptable standard has been achieved.

The Contractor shall use Equipment for haulage and **Labour** for spreading unless the Engineer instructs otherwise.

Work Method: **LB-MB**

Quality Control:

- The gravel surface width shall be checked at 100m intervals and shall have a tolerance of $\pm$ 50mm
- Trial holes shall be dug as directed by the Engineer to check the gravel thickness and shall have a tolerance of + 5mm / - 20mm
- The camber shall be checked at 50m intervals and the maximum tolerance shall be $\pm$ 1 %
- The longitudinal profile shall be checked after the compaction of each load to ensure a smooth surface with no corrugations or depressions, tolerance of $\pm$ 10mm.
- Compaction shall show no movement of material under the roller, minimum of 6 passes.
- Compaction test standard shall be 95% MDD (AASHTO T180)

Measurement Unit: m^3

The measurement shall be the volume of compacted gravel surfacing measured net according to the Drawings and shall include the excavation and the 1.5km 'free' haul distance

Payment

The unit rate shall be the full compensation for labour, tools, equipment and incidental costs required for carrying out the work.

10-70-001: Site clearance of borrow area.

This activity should be done in accordance with Bill 4, sub clauses 4.01 to 4.05 in the Standard Specifications for Roads and Bridges 1986.

10-70-002: Removal of Overburden

The Contractor shall remove overburden from quarries and borrow pits, which includes excavation, loading, hauling and stockpiling at approved locations. The thickness of the overburden layer to be removed shall be determined from trial pits dug on a 30 metre grid within the quarry area.

The overburden shall be deposited neatly for re-use to reinstate the quarry on completion of the Works, as directed by the Engineer.

The Contractor shall use **Labour** to carry out this item unless the Engineer instructs otherwise.

Work Method: **LB or MB**

Quality Control

- The location and manner of stock piling of the overburden for the reinstatement of the quarry shall be to the approval of the Engineer.

Measurement Unit: m^3

The measurement shall be the volume of overburden removed as calculated from the cleared area and the mean depth indicated from the trial pits.

Payment

The unit rate shall include full compensation for labour, tools materials and equipment, haulage, stockpiling and incidental costs required for carrying out the work.

10-70-003: Restoration of Quarries and Borrow Pits

The Contractor shall level the ground, return the topsoil from the stockpiles, and uniformly spread the material over the full excavation area.

Adequate drainage provisions shall be made to protect the excavation areas, and where necessary appropriate protection measures shall be taken to avoid erosion of the spread topsoil layer. Grass and trees shall be replanted as directed by the Engineer.

The Contractor shall use **Labour** and/or **Equipment** to carry out this item as agreed by the Engineer.

Work Method: **LB, LM-MB**

Quality Control

The Engineer shall check that the required measurements have been satisfactorily taken.

Measurement and Payment: Provisional Sum

Payment shall be made on a Dayworks basis for the labour and equipment as directed by the Engineer

DRAWINGS

FIGURE C.1-CROSS SECTION A (MINOR STANDARD CROSS-SECTION)

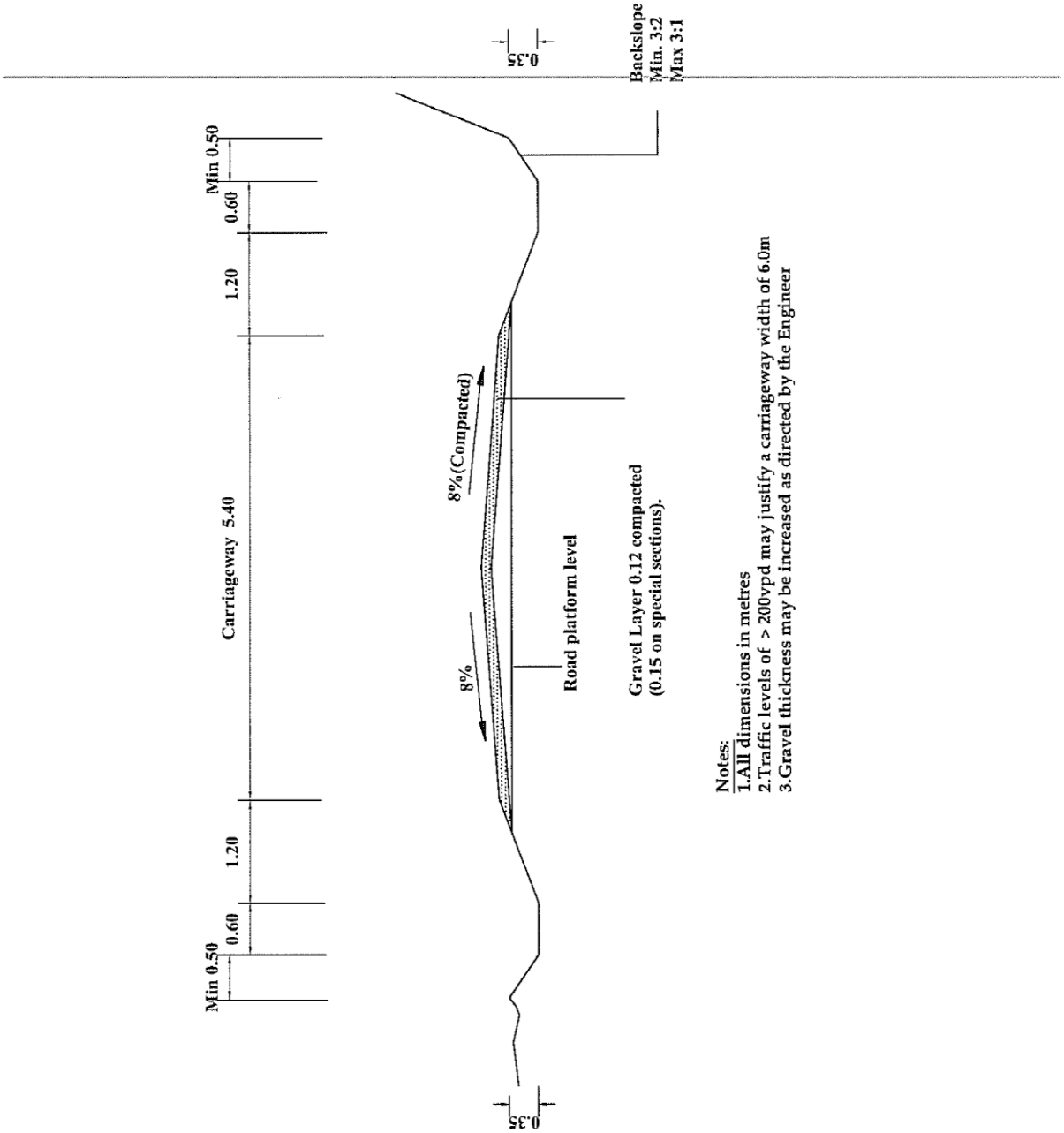


FIGURE C2- CROSS SECTION B (REDUCED CROSS-SECTION)

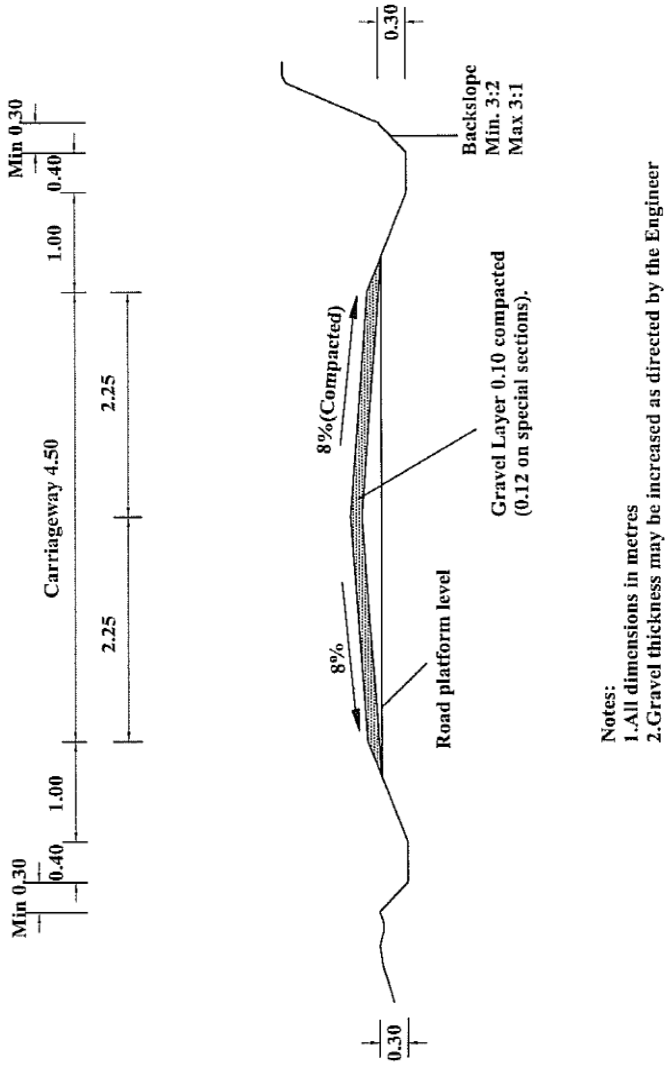
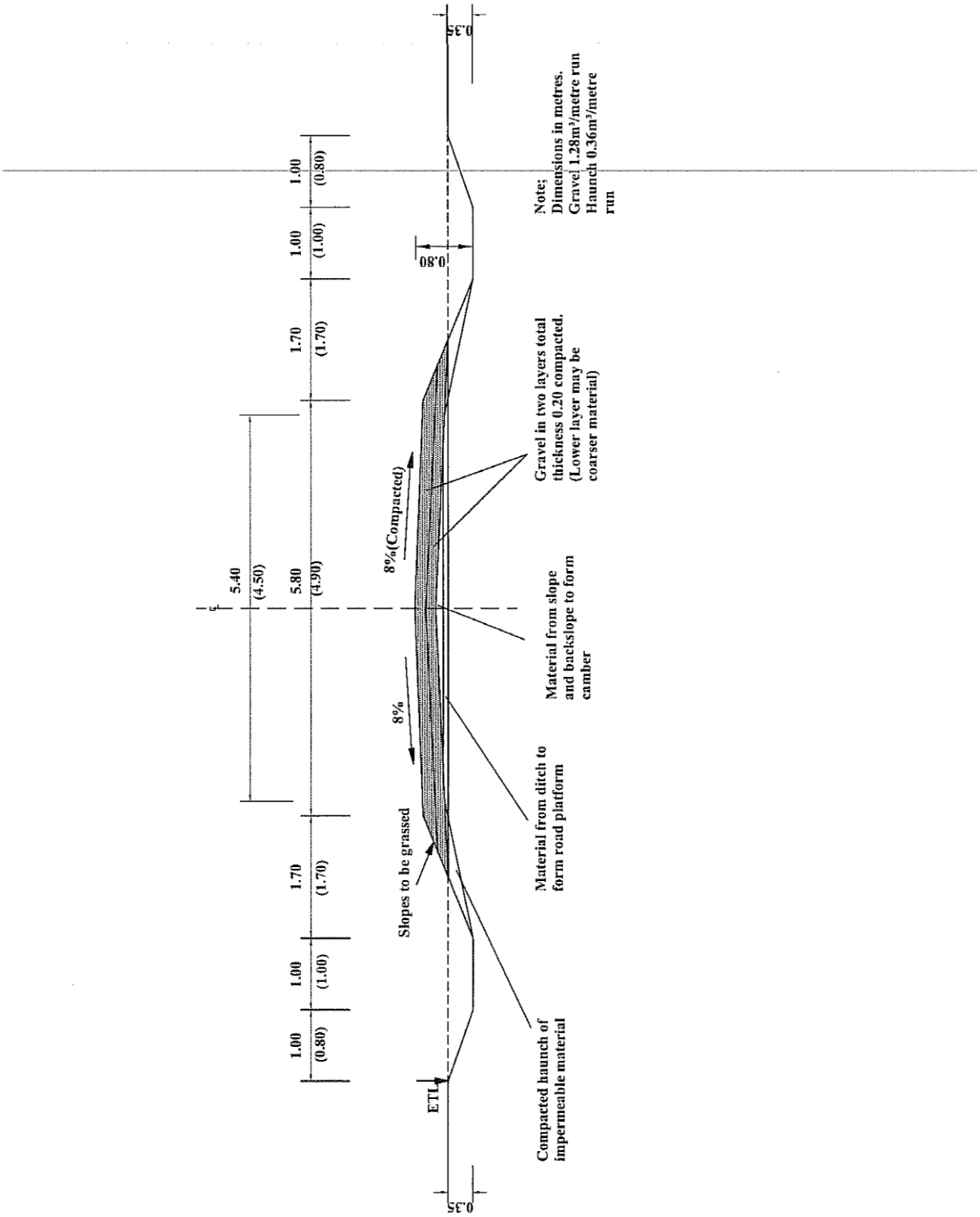
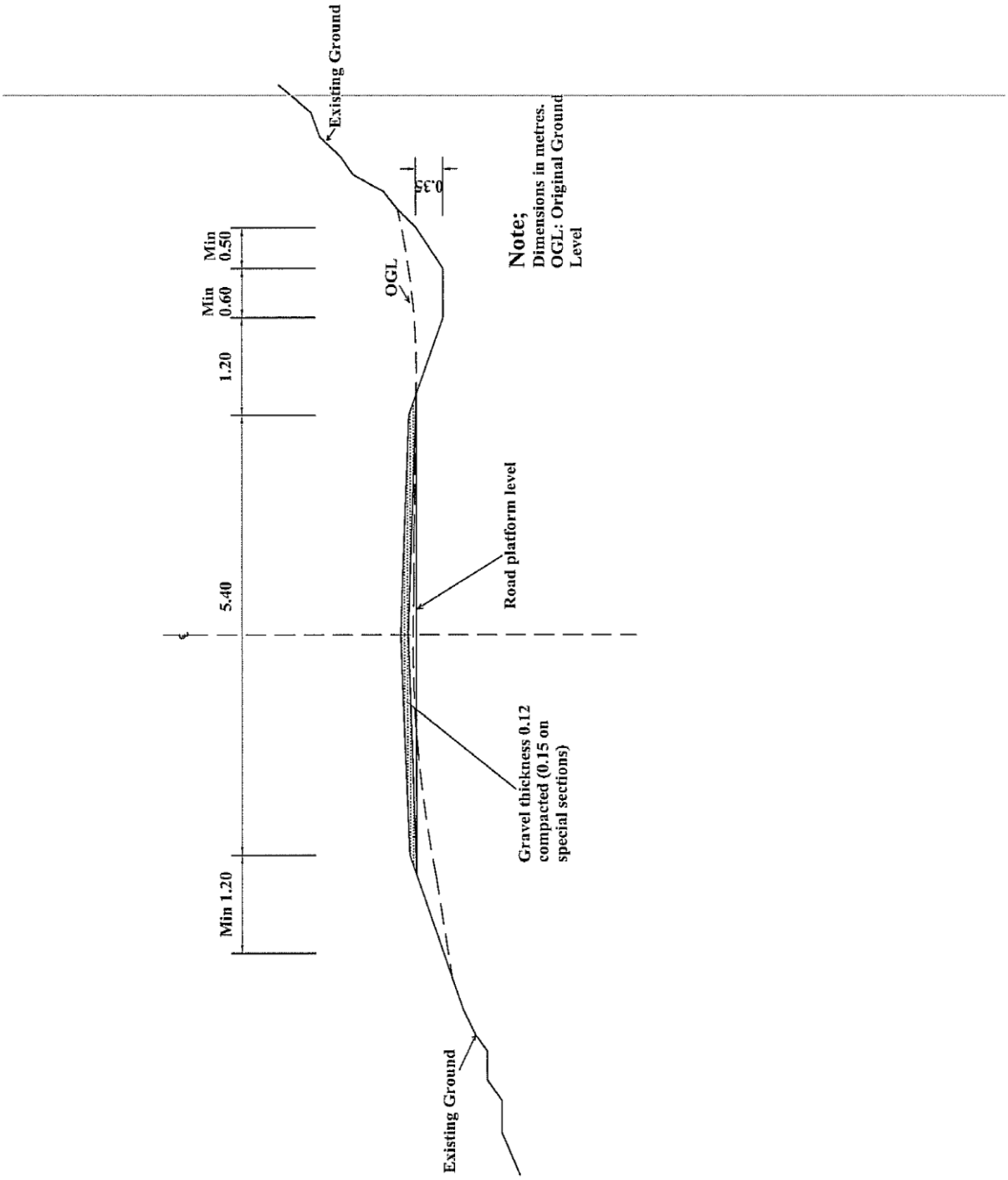


FIGURE C3-CROSS- SECTION C (BLACK COTTON SOIL)



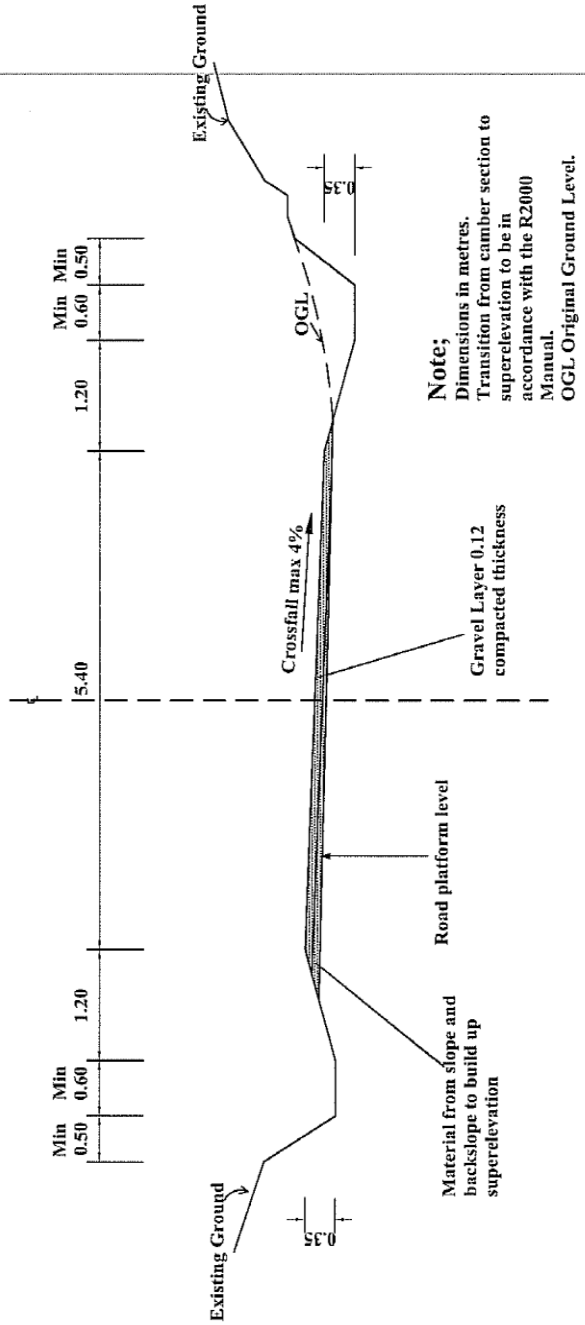
C-3

FIGURE C4-CROSS- SECTION D (SIDELONG GROUND)



C-4

FIGURE C5- STANDARD CROSS- SECTION (SUPERELEVATION)



C-5

FIGURE C6 MITRE DRAINS

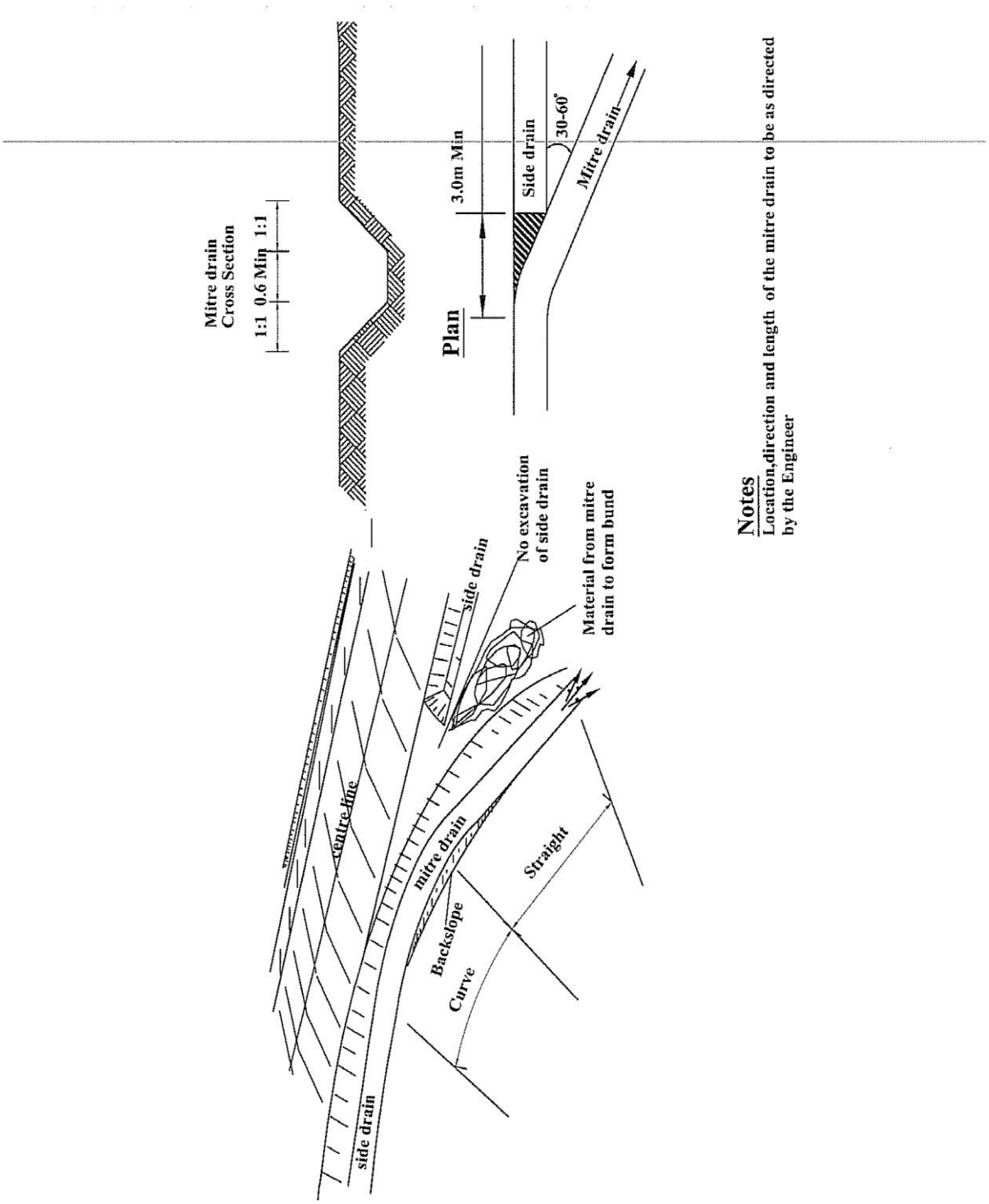
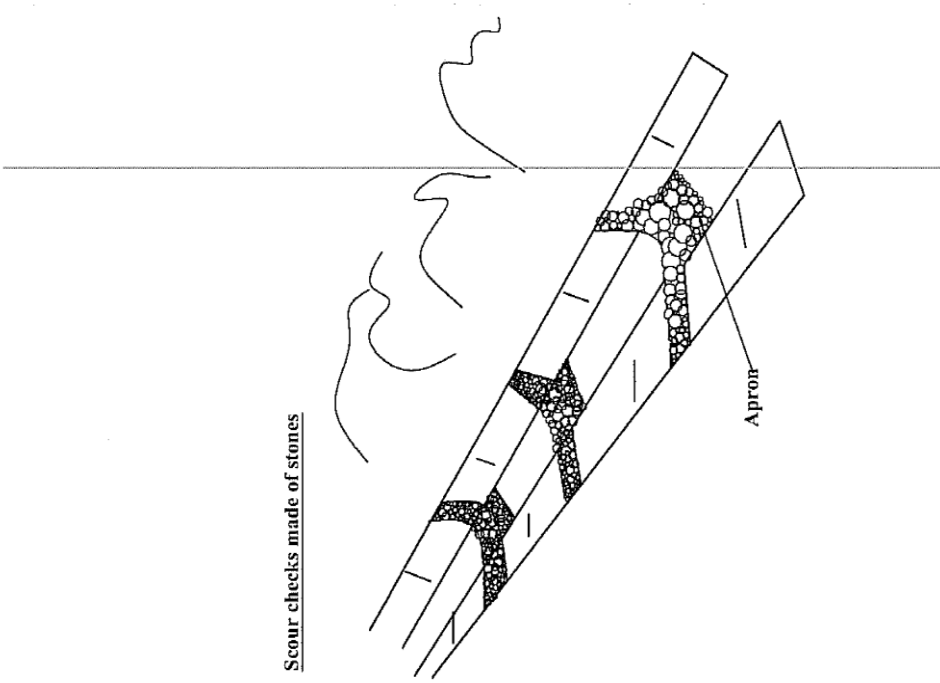


FIGURE C.7 SCOUR CHECKS



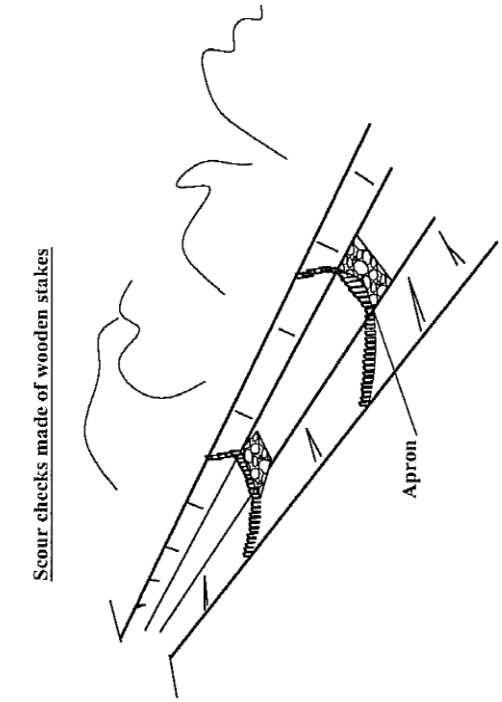
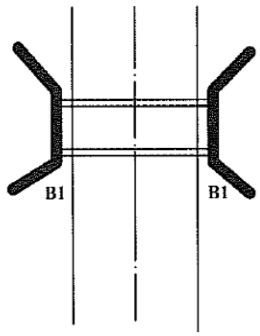
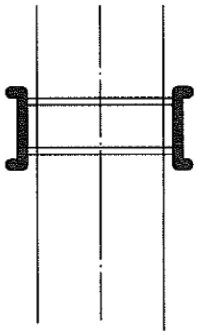


FIGURE C10- CULVERT ENTRY/EXIT STRUCTURE TYPES

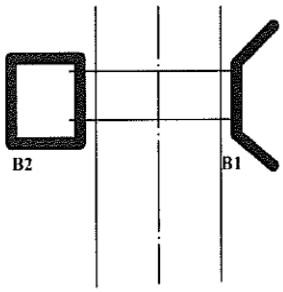
TYPE1(ENTRY AND EXIT)



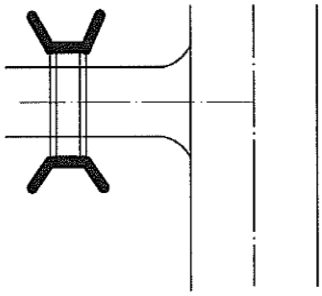
TYPE3(ENTRY AND EXIT)



TYPE 2(ENTRY ONLY)



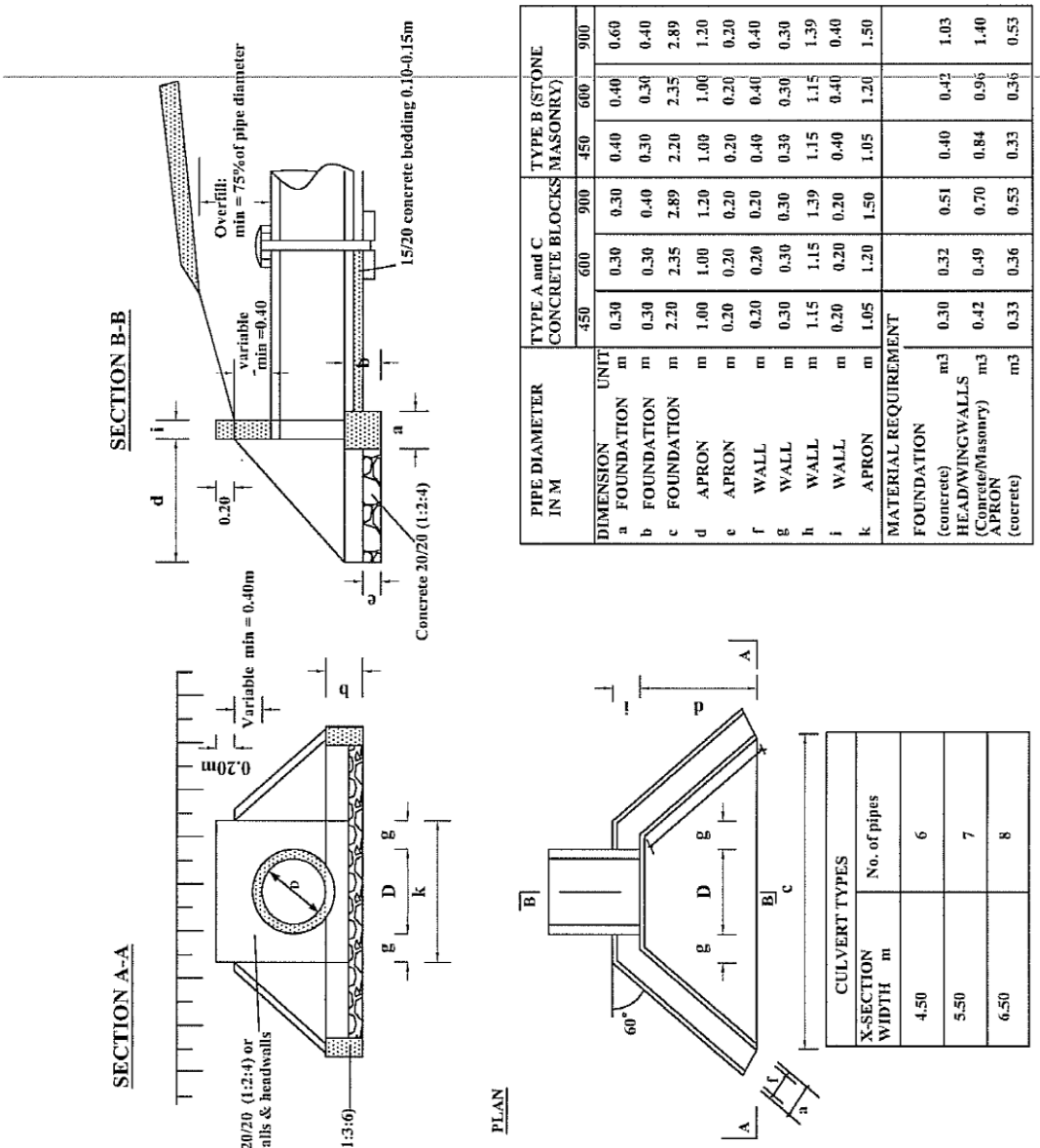
TYPE 4(ENTRY AND EXIT ON ACCESS)



NOTE

1. The code numbers specify the shape and function and the code letter denotes the material;
A =Concrete block
B =Stone masonry
C =Concrete

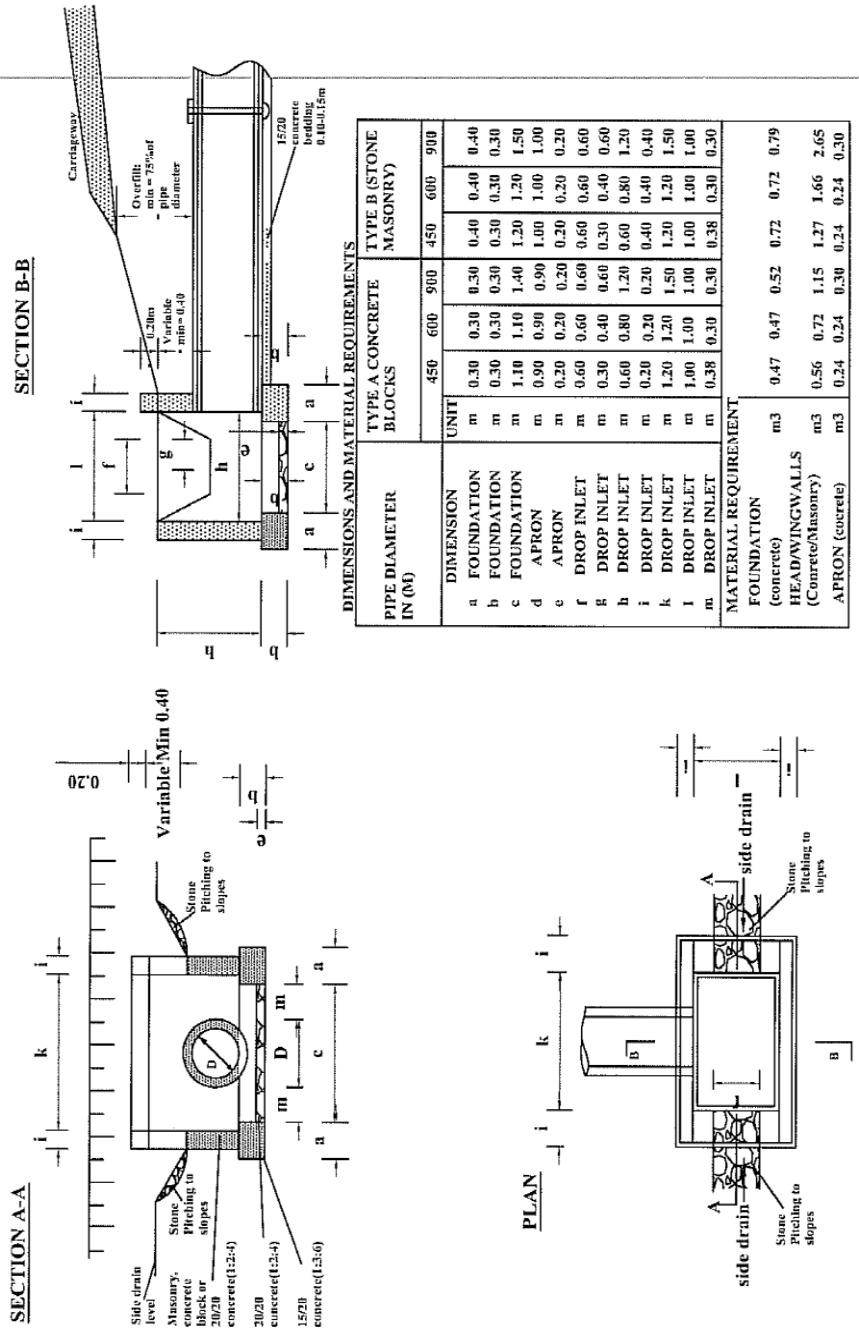
FIGURE C11- HEADWALL TYPE 1 (HEAD AND WINGWALLS)



PIPE DIAMETER IN M			TYPE A and C CONCRETE BLOCKS			TYPE B (STONE MASONRY)		
			450	600	900	450	600	900
DIMENSION	UNIT							
a	FOUNDATION	m	0.30	0.30	0.30	0.40	0.40	0.60
b	FOUNDATION	m	0.30	0.30	0.40	0.30	0.30	0.40
c	FOUNDATION	m	2.20	2.35	2.89	2.20	2.35	2.89
d	APRON	m	1.00	1.00	1.20	1.00	1.00	1.20
e	APRON	m	0.20	0.20	0.20	0.20	0.20	0.20
f	WALL	m	0.20	0.20	0.20	0.40	0.40	0.40
g	WALL	m	0.30	0.30	0.30	0.30	0.30	0.30
h	WALL	m	1.15	1.15	1.39	1.15	1.15	1.39
i	WALL	m	0.20	0.20	0.20	0.40	0.40	0.40
k	APRON	m	1.05	1.20	1.50	1.05	1.20	1.50
MATERIAL REQUIREMENT								
FOUNDATION (concrete)		m3	0.30	0.32	0.51	0.40	0.42	1.03
HEAD/WINGWALLS (Concrete/Masonry)		m3	0.42	0.49	0.70	0.84	0.96	1.40
APRON (concrete)		m3	0.33	0.36	0.53	0.33	0.36	0.53

CULVERT TYPES	
X-SECTION WIDTH m	No. of pipes
4.50	6
5.50	7
6.50	8

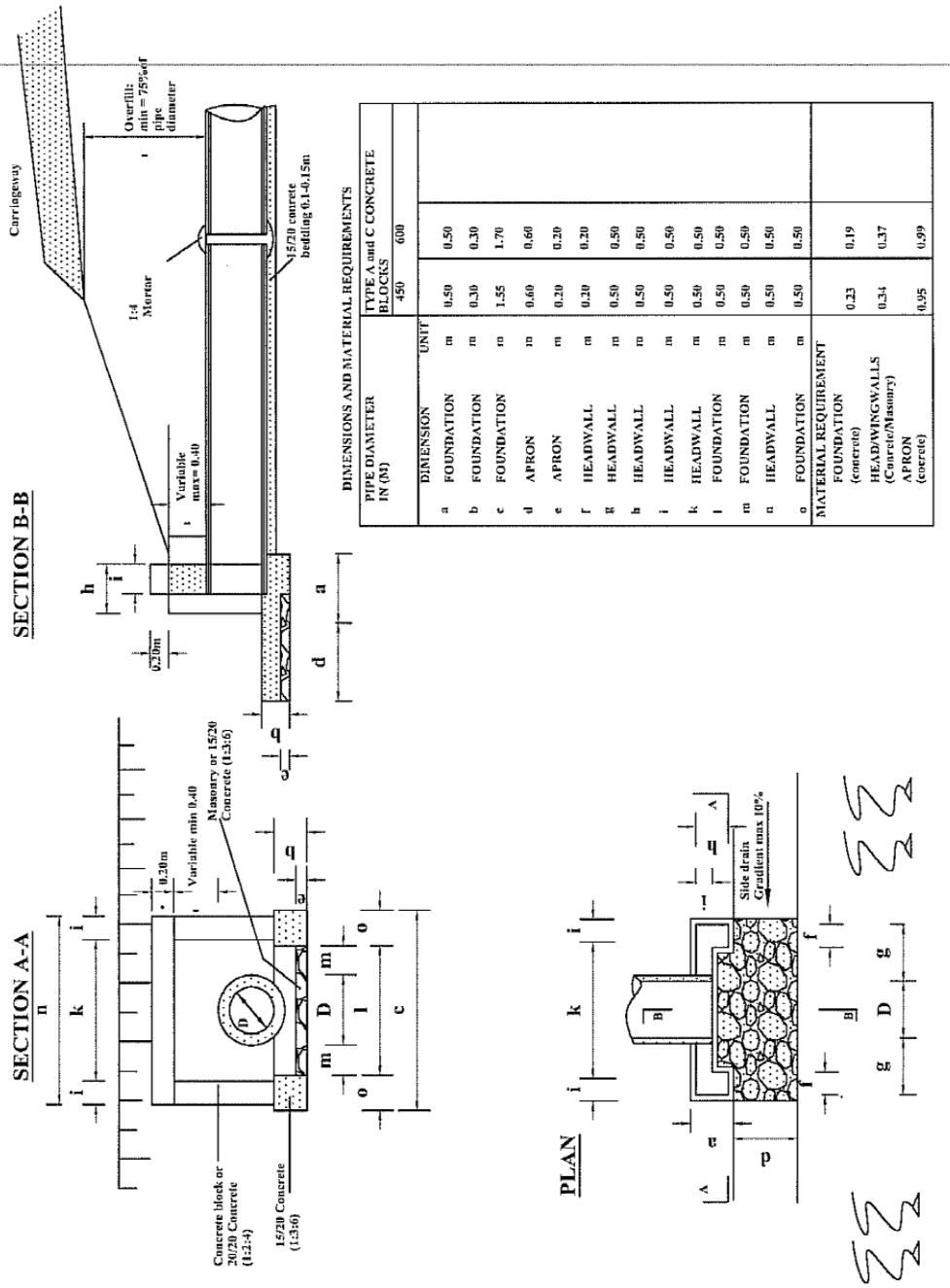
FIGURE C12-HEADWALL TYPE 2(DROP INLET)



DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)			TYPE A CONCRETE BLOCKS				TYPE B (STONE MASONRY)			
			450	600	900		450	600	900	
	DIMENSION	UNIT								
a	FOUNDATION	m	0.30	0.30	0.30	0.40	0.40	0.40	0.40	0.40
b	FOUNDATION	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
c	FOUNDATION	m	1.10	1.10	1.40	1.20	1.20	1.20	1.20	1.50
d	APRON	m	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00
e	APRON	m	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
f	DROP INLET	m	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
g	DROP INLET	m	0.30	0.40	0.60	0.30	0.40	0.40	0.60	0.60
h	DROP INLET	m	0.60	0.80	1.20	0.60	0.80	0.80	1.20	1.20
i	DROP INLET	m	0.20	0.20	0.20	0.40	0.40	0.40	0.40	0.40
k	DROP INLET	m	1.20	1.20	1.50	1.20	1.20	1.20	1.20	1.50
l	DROP INLET	m	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
m	DROP INLET	m	0.38	0.30	0.30	0.38	0.30	0.30	0.30	0.30
	MATERIAL REQUIREMENT									
	FOUNDATION (concrete)	m3	0.47	0.47	0.52	0.72	0.72	0.72	0.72	0.79
	HEAD/WINGWALLS (Conrete/Masonry)	m3	0.56	0.72	1.15	1.27	1.27	1.66	2.65	
	APRON (concrete)	m3	0.24	0.24	0.30	0.24	0.24	0.24	0.30	

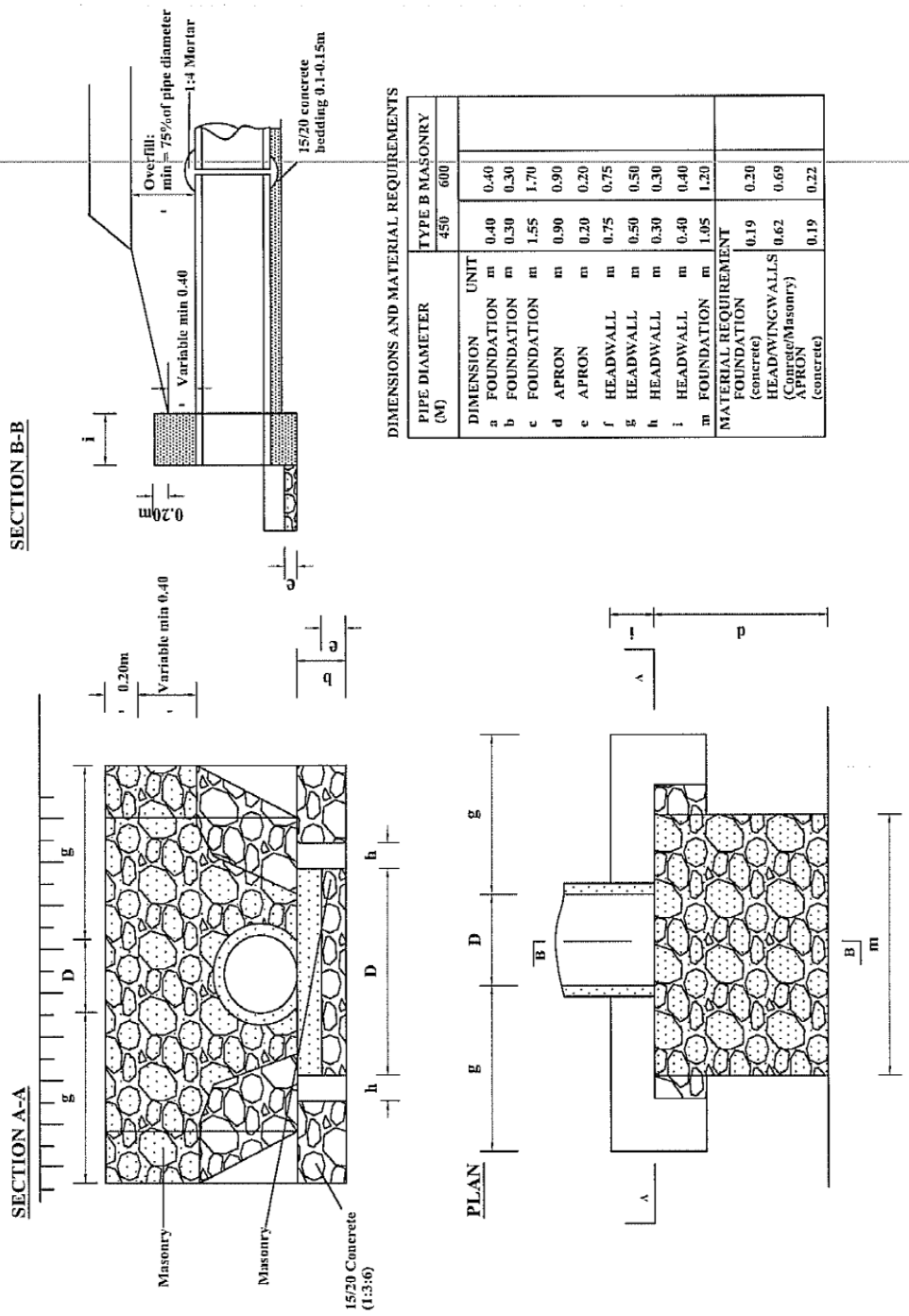
FIGURE C.13-HEADWALL TYPE 3A (CONCRETE/ BLOCK HEADWALLS



DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)			TYPE A and C CONCRETE BLOCKS	
	DIMENSION	UNIT	450	600
a	FOUNDATION	m	0.50	0.50
b	FOUNDATION	m	0.30	0.30
c	FOUNDATION	m	1.55	1.70
d	APRON	m	0.60	0.60
e	APRON	m	0.20	0.20
f	HEADWALL	m	0.20	0.20
g	HEADWALL	m	0.50	0.50
h	HEADWALL	m	0.50	0.50
i	HEADWALL	m	0.50	0.50
k	HEADWALL	m	0.50	0.50
l	FOUNDATION	m	0.50	0.50
m	FOUNDATION	m	0.50	0.50
n	HEADWALL	m	0.50	0.50
o	FOUNDATION	m	0.50	0.50
MATERIAL REQUIREMENT				
	FOUNDATION (concrete)		0.23	0.19
	HEADWINGWALLS (Concrete/Masonry)		0.34	0.37
	APRON (concrete)		0.95	0.99

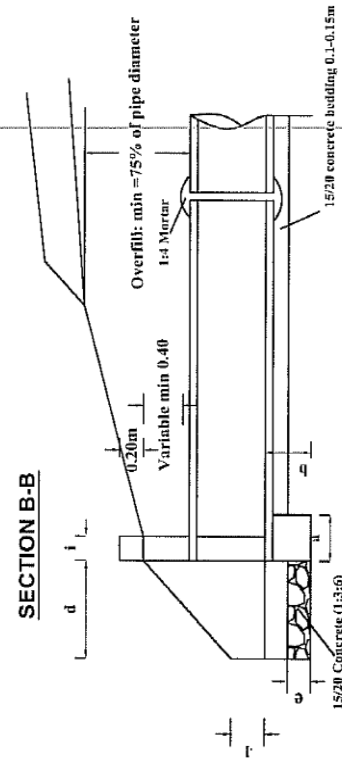
FIGURE C14-HEADWALL TYPE 3B(STONE MASONRY HEADWALLS)

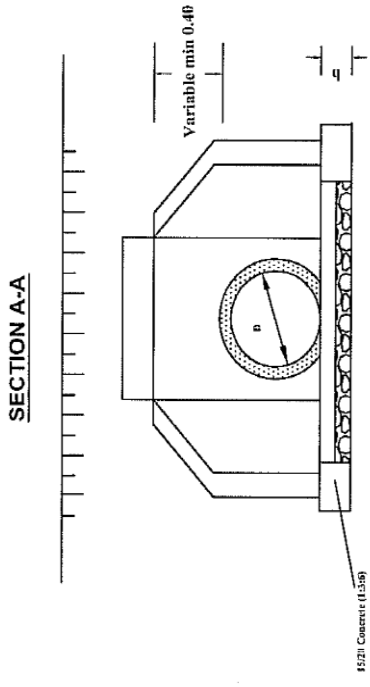


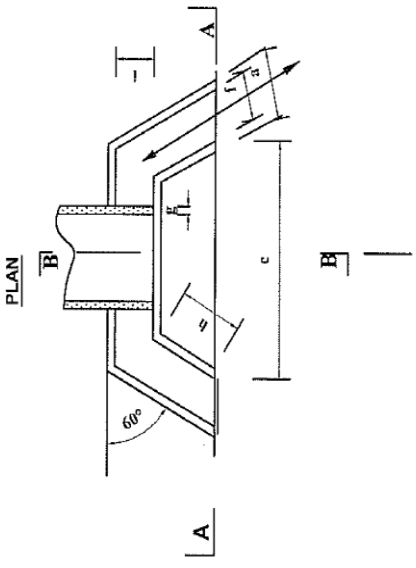
DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER (M)			TYPE B MASONRY	
			450	600
DIMENSION		UNIT		
a	FOUNDATION	m	0.40	0.40
b	FOUNDATION	m	0.30	0.30
c	FOUNDATION	m	1.55	1.70
d	APRON	m	0.90	0.90
e	APRON	m	0.20	0.20
f	HEADWALL	m	0.75	0.75
g	HEADWALL	m	0.50	0.50
h	HEADWALL	m	0.30	0.30
i	HEADWALL	m	0.40	0.40
m	FOUNDATION	m	1.05	1.20
MATERIAL REQUIREMENT				
FOUNDATION (concrete)			0.19	0.20
HEAD/WINGWALLS (Conrete/Masonry)			0.62	0.69
APRON (concrete)			0.19	0.22

FIGURE C15-HEADWALL TYPE 4(FOR ACCESS CULVERTS)



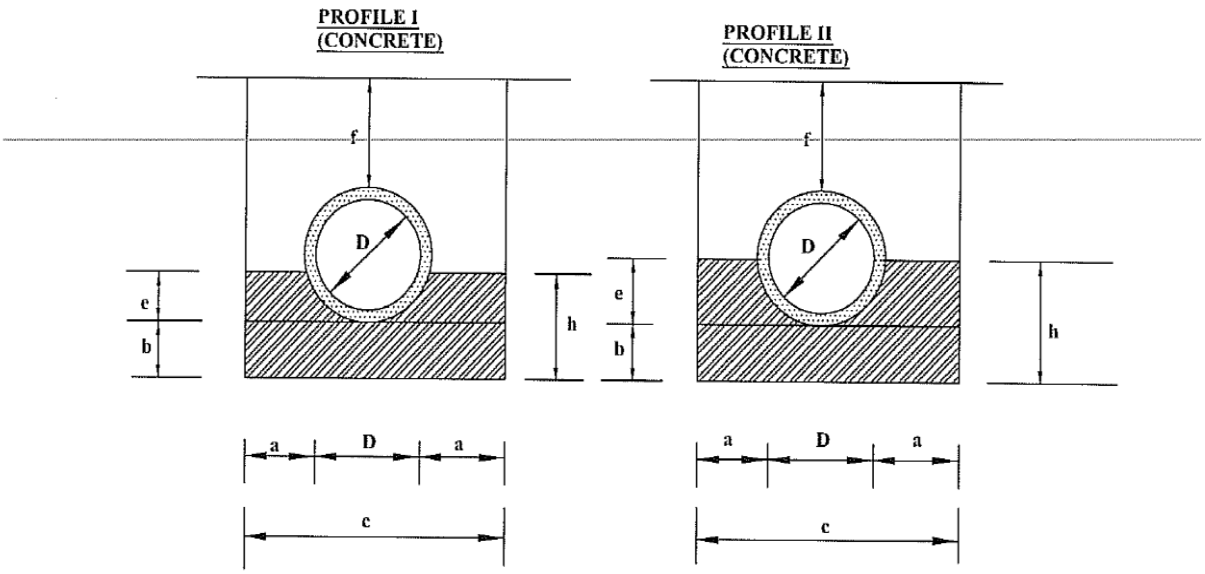




DIMENSIONS AND MATERIAL REQUIREMENTS

	PIPE DIAMETER IN (M)		TYPE A (CONCRETE BLOCKS)			TYPE B (STONE MASONRY)		
	DIMENSION	UNIT	450	600	900	450	600	900
a	FOUNDATION	m	0.30	0.30		0.40	0.40	
b	FOUNDATION	m	0.30	0.30		0.30	0.30	
c	APRON	m	1.34	1.49		1.34	1.49	
d	APRON	m	0.60	0.60		0.60	0.60	
e	APRON	m	0.20	0.20		0.20	0.20	
f	WINGWALLS	m	0.20	0.20		0.40	0.40	
g	WINGWALLS	m	0.10	0.10		0.10	0.10	
h	HEADWALLS	m	0.69	0.69		0.69	0.69	
i	HEADWALLS	m	0.20	0.20		0.40	0.40	
k	HEADWALLS	m	0.65	0.80		0.65	0.80	
l	HEADWALLS	m	0.40	0.40		0.40	0.40	
MATERIAL REQUIREMENT								
FOUNDATION (concrete 1:2:4)(m)			0.16	0.20		0.24	0.26	
HEAD/WINGWALLS (Concrete/Masonry)			0.28	0.32		0.53	0.61	
APRON (concrete)			0.12	0.14		0.12	0.14	

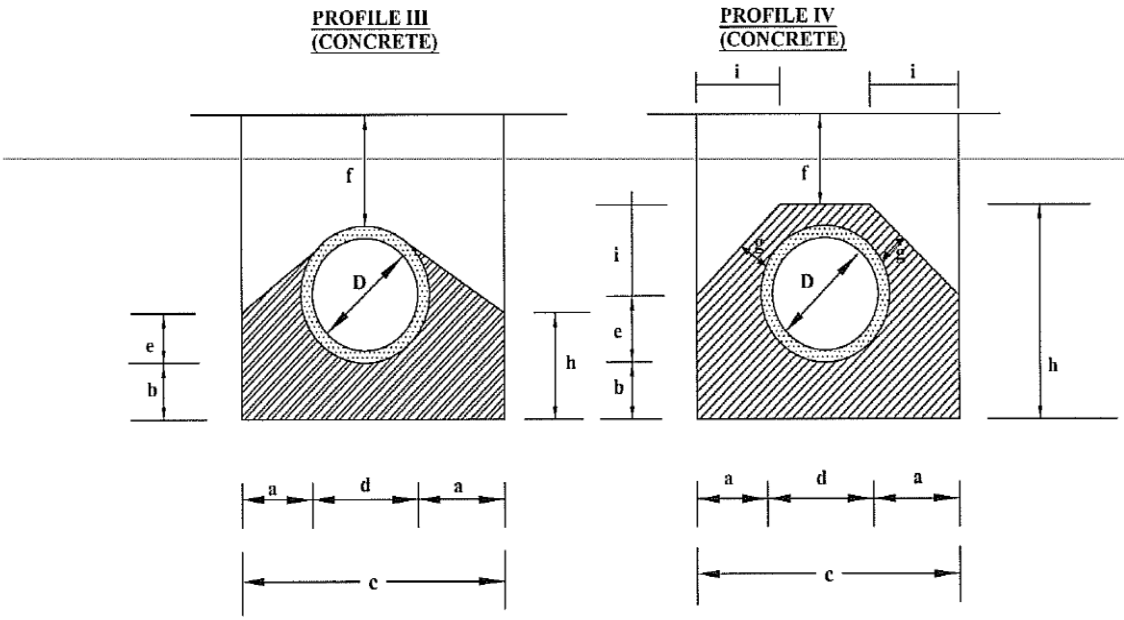
FIGURE C16-BEDDING AND HAUNCH PROFILE TYPES I &II



Diameter (D)	450 (mm)	600 (mm)	900 (mm)
a	0.15	0.20	0.20
b	0.10	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.14	0.18	0.27
f(min)	0.34	0.45	0.68
g	-	-	-
h	0.24	0.33	0.42
i	-	-	-
Concrete	Volume in (m3/m)		
Class 15/20	0.24	0.24	0.24
Application	-Fair subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Remarks	Material for back/overfill shall be approved by the Engineer		

450 (mm)	600 (mm)	900 (mm)
0.15	0.20	0.20
0.10	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.28	0.36	0.54
0.34	0.45	0.68
-	-	-
0.38	0.51	0.69
-	-	-
Volume in (m3/m)		
0.20	0.37	0.56
-Fair to poor subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Material for back/overfill shall be approved by the Engineer		

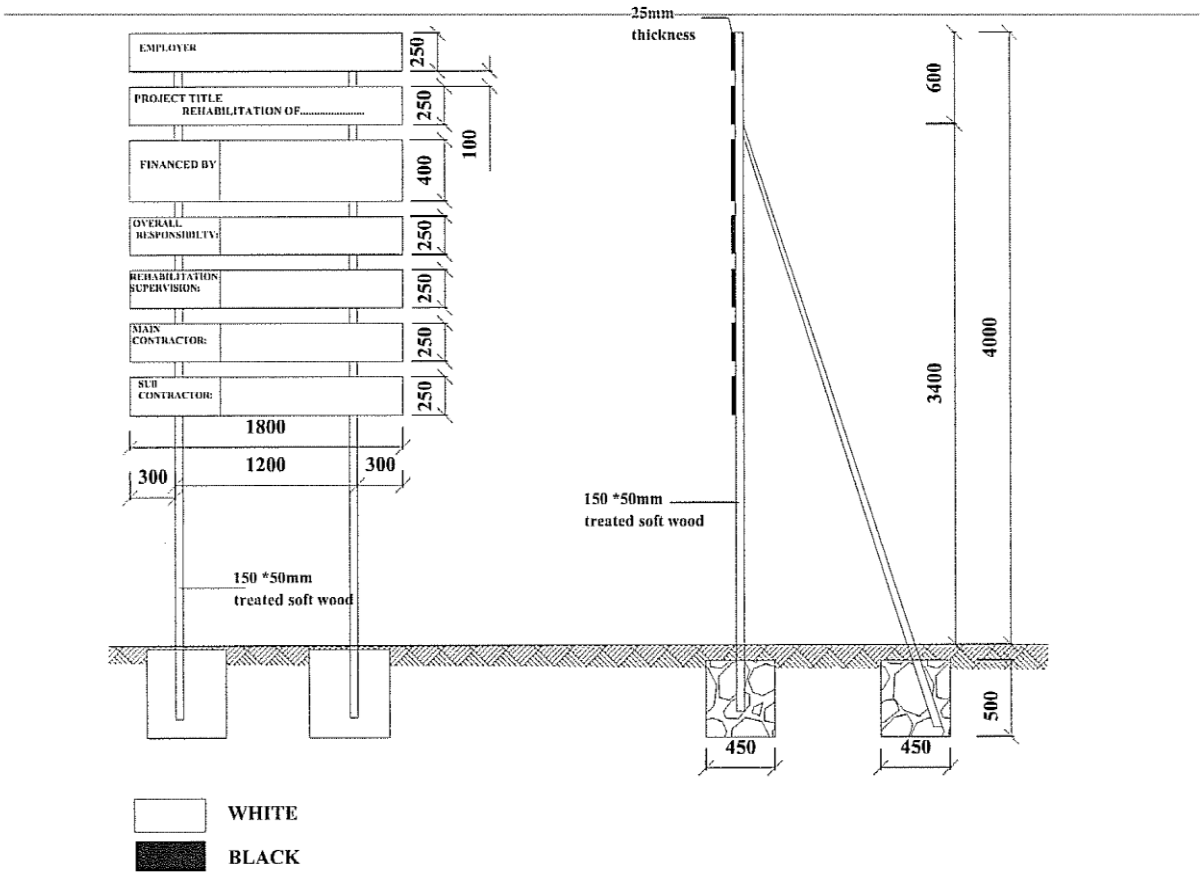
FIGURE C17-BEDDING AND SURROUND PROFILE TYPES III &IV



Diameter (D)	450 (mm)	600 (mm)	900 (mm)
a	0.15	0.20	0.20
b	0.10	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.42	0.54	0.81
f(min)	0.23	0.3	0.45
g	-	-	-
h	0.52	0.69	0.96
i	-	-	-
Concrete	Volume in (m3/m)		
Class 15/20	0.26	0.47	0.71
Application	-Fair subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Remarks	Material for back/overfill shall be approved by the Engineer		

450 (mm)	600 (mm)	900 (mm)
0.15	0.20	0.20
0.10	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.46	0.52	0.78
0.15	0.15	0.15
0.15	0.15	0.15
0.81	1.02	1.38
0.28	0.35	0.45
Volume in (m3/m)		
0.37	0.61	0.92
-Fair to poor subgrade condition -Overfill > 75% of the pipe diameter -Seasonal water flow only		
Material for back/overfill shall be approved by the Engineer		

FIGURE C23-PUBLICITY SIGNBOARD



NOTES

1. The wording of the project sign board and the location to be as directed by the Engineer.
2. Materials to be used for fabrication of signboard shall be pressure impregnated treated softwood timber
3.Wording board posts to be attached to the posts with galvanised nails
4.Project board posts and struts to be embedded in concrete class 20/20(1:2:4)

PREAMBLE TO BILLS OF QUANTITIES

1. The Bills of Quantities form part of the Contract Documents and are to be read in conjunction with the Instructions to Tenderers and these Documents.

2. The prices and rates to be inserted in the Bills of Quantities are to be the full, inclusive value of the work described under the several items including all costs and expenses which may be required in and for the execution of the work described and for the Contractor's overheads and profits. The rates shall be VAT exclusive but include all other taxes, levies and fees applicable. The rates shall be based on the Works being carried out in accordance with the R2000 Strategy of using optimum labour resources.

3. Each item in the Bills of Quantities contains only a brief description of the required work. Fuller details and descriptions of the work to be done, the materials to be used, the standards of workmanship, methods of measurement and payment are to be found in the various sections of the Specifications and on the Drawings.

4. The Quantities set out in the Bills of Quantities are estimated and represent substantially the work to be carried out. There is no guarantee that the Contractor will be required to carry out all the quantity of work indicated under any one particular item or group of items in the Bills of Quantities. The basis of payment shall be the Contractor's rates and the quantities of measured work done in fulfilment of the obligations under the Contract.

5. Work shall be carried out under Dayworks items only at the direction, and with the approval, of the Engineer. The Contractor shall enter rates in the Dayworks Schedule of Rates, which shall reflect the realistic costs, including overheads and profit, of each item. If, in the opinion of the Engineer, a rate is unreasonably high or low, the Contractor may be required to amend the rate to the satisfaction of the Engineer.

BILLS OF QUANTITIES

Road Code C705 Section Name OLOLPIRONITO - EOR EKULE

Package: KeRRA/011/NRK/NE/22%/039/2-45-19|20-018

Bill of Quantities

Bill No.1	General: Office administration and overheads/Preliminaries				Project:
Item No.	**Description**	**Units**	**Quantity**	**Unit Bid Rate(Ksh)**	**Amount KSh**
01-80-016	Provide and erect publicity signs as directed by the Engineer	NO.	2		
	Total Carried Forward to Summary:				

Road Code C705 Section Name OLOLPIRONITO - EOR EKULE

Package: KeRRA/011/NRK/NE/22%/039/2-45-19|20-018

Bill of Quantities

Page: 2

Bill No.8	CULVERT AND DRAINAGE WORKS				Project:
Item No.	**Description**	**Units**	**Quantity**	**Unit Bid Rate(Ksh)**	**Amount KSh**
08-60-009	Culvert Cleaning- Fully Blocked - 900mm	MT	49		
08-70-006	Construction Of scour checks (concrete)	NO	100		
	Total Carried Forward to Summary:				

Road Code C705 Section Name OLOLPIRONITO - EOR EKULE

Package: KeRRA/011/NRK/NE/22%/039/2-45-19|20-018

Bill of Quantities

Page: 3

Bill No.10	GRADING AND GRAVELLING WORKS				Project:
Item No.	**Description**	**Units**	**Quantity**	**Unit Bid Rate(Ksh)**	**Amount KSh**
10-50-001	Heavy grading as instructed by the Engineer	M²	160000		
	Total Carried Forward to Summary:				

RoadCode C705
Section Name: OLOLPIRONITO - EOR EKULE
Package: KeRRA/011/NRK/NE/22%/039/2-45-19|20-018

Bill of Quantities		Page: 1
	Summary	**Project:**
Item No.	**Description**	**Amount (KShs)**
1	General: Office administration and overheads/Preliminaries	
8	CULVERT AND DRAINAGE WORKS	
10	GRADING AND GRAVELLING WORKS	
	Sub Total	
	VAT @ 16 %	
	Total	
	Contingencies (@ 0 %)	
	Carried to page on the form of Tender	