



REPUBLIC OF KENYA

**MINISTRY OF WATER, SANITATION AND IRRIGATION
STATE DEPARTMENT FOR IRRIGATION**

INVITATION TO TENDER

**MINISTRY OF WATER, SANITATION & IRRIGATION,
STATE DEPARTMENT FOR IRRIGATION**

P. O. BOX 49720-00100

Email address: ps@irrigation.go.ke

**CONSTRUCTION OF MBUGITI IRRIGATION PROJECT, GATANGA SUB-COUNTY –
MURANG'A COUNTY: TENDER NO. MWSI/SDI/ONT/020/2023-2024**

DATE 14TH MAY, 2024

The Ministry of Water, Sanitation and Irrigation, State Department for Irrigation invites sealed tenders for Construction of Mbugiti Irrigation Project, Gatanga Sub-County – Murang'a County.

1. Tendering will be conducted under open competitive method (National) using a standardized tender document. Tendering is open to all qualified and interested Tenderers.

In case tender is subject to multiple contracts/lots, insert **"Tenderers will be allowed to tender for one or more". N/A**

In case this tender is subject to a Reservation, specify the Group is eligible to tender, insert e.g., "Tendering is open to all Small and Medium Enterprises registered appropriately with NCA 4 and above (Water Works)."

Tenderers are advised that they will not be allowed to tender for more than one project; if a firm tender for more than one tender, the firm will automatically be disqualified.

2. Qualified and Interested tenderers may obtain further information and inspect the Tendering Documents at the offices of the Head of Procurement State department for Irrigation, Maji House 3rd floor room 316 along Ngong Road from 9.00 a.m. to 5.p.m on Mondays to Fridays inclusive except on public holidays at the address given below.
3. A complete set of Tendering Document(s) may be obtained by interested Tenderers by downloading from the website www.water.go.ke or <http://www.tenders.go.ke>. Downloaded tender documents will be free of charge.
4. Tender documents may be viewed and downloaded for free from the website www.water.go.ke or <http://www.tenders.go.ke> Tenderers who download the tender document must forward/register their particulars immediately with the Head of Supply chain management office during normal working hours, or sent to procurement@irrigationkenya.go.ke to facilitate any further clarification or addendum.
5. Tenders shall be quoted in Kenya Shillings and shall be inclusive all taxes. Tenders shall remain valid for **150 days** from the date of opening of tenders.
6. All Tenders must be accompanied by a tender Security of **2% of the total tender sum** from a reputable bank or Insurance companies authorized by PPRA.
7. The Tenderer shall chronologically serialize all pages of the tender documents submitted.
8. Completed tenders must be delivered to the address below on or before **29th May, 2024 at 11.00 am**. Electronic Tenders will not be permitted.
9. Tenders will be opened immediately after the deadline date and time specified above or any dead line date and time specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.
10. Late tenders will be rejected.
11. The addresses referred to above are:
 - A. **Address for obtaining further information and for purchasing tender documents**

Ministry of Water, Sanitation and Irrigation, Principal Secretary State Department for Irrigation, Maji House, P.O. Box 49720-00100, Nairobi, telephone+254 020 2716103, 4900000, 3rd floor room 316 along Ngong Road from 9.00 a.m. to 5.00 p.m. on Mondays to Fridays except on public holidays at their convenient time or ps@irrigationkenya.go.ke or procurement@irrigationkenya.go.ke

B. Address for Submission of tenders

Ministry of Water, Sanitation and Irrigation

Principal Secretary

State Department for Irrigation

P.O. BOX 49720-00100 Nairobi

C. [Authorized Official (name, designation, Signature and date)]

Name: A.O NYAMBECHÉ (Official of the Procuring Entity issuing the invitation)

Designation: Director-SCMS Signature Date

PART 1 - TENDERING PROCEDURES

SECTION I: INSTRUCTIONS TO TENDERERS

A General Provisions

1. **Scope of Tender**

- 1.1 The Procuring Entity as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The name, identification, and number of lots (contracts) of this Tender Document are **specified in the TDS**.

2. **Fraud and Corruption**

- 2.1 The Procuring Entity requires compliance with the provisions of the Public Procurement and Asset Disposal Act, 2015, Section 62 "Declaration not to engage in corruption". The tender submitted by a person shall include a declaration that the person shall not engage in any corrupt or fraudulent practice and a declaration that the person or his or her subcontractors are not debarred from participating in public procurement proceedings.
- 2.2 The Procuring Entity requires compliance with the provisions of the Competition Act 2010, regarding collusive practices in contracting. Any tenderer found to have engaged in collusive conduct shall be disqualified and criminal and/or civil sanctions may be imposed. To this effect, Tenders shall be required to complete and sign the "Certificate of Independent Tender Determination" annexed to the Form of Tender.
- 2.3 Unfair Competitive Advantage - Fairness and transparency in the tender process require that the firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender. To that end, the Procuring Entity shall indicate in the **Data Sheet** and make available to all the firms together with this tender document all information that would in that respect give such firm any unfair competitive advantage over competing firms.
- 2.4 Unfair Competitive Advantage -Fairness and transparency in the tender process require that the Firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender being tendered for. The Procuring Entity shall indicate in the **TDS** firms (if any) that provided consulting services for the contract being tendered for. The Procuring Entity shall check whether the owners or controllers of the Tenderer are same as those that provided consulting services. The Procuring Entity shall, upon request, make available to any tenderer information that would give such firm unfair competitive advantage over competing firms.

3. **Eligible Tenderers**

- 3.1 A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution subject to ITT 3.7 or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. Public employees and their close relatives (spouses, children, brothers, sisters and uncles and aunts) are not eligible to participate in the tender. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution. The maximum number of JV members shall be specified in the **TDS**.
- 3.2 Public Officers of the Procuring Entity, their Spouses, Child, Parent, Brothers or Sister.
Child, Parent, Brother or Sister of a Spouse, their business associates or agents and firms/organizations in which they have a substantial or controlling interest shall not be eligible to tender or be awarded a contract. Public Officers are also not allowed to participate in any procurement proceedings.
- 3.3 A Tenderer shall not have a conflict of interest. Any tenderer found to have a conflict of interest shall be disqualified. A tenderer may be considered to have a conflict of interest for the purpose of this tendering process, if the tenderer:
- a) Directly or indirectly controls, is controlled by or is under common control with another tenderer; or
 - b) Receives or has received any direct or indirect subsidy from another tenderer; or
 - c) Has the same legal representative as another tenderer; or
 - d) Has a relationship with another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process; or
 - e) Any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the tender; or
 - f) any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as Engineer for the Contract implementation; or
 - g) Would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the contract specified in this Tender Document or
 - h) Has a close business or family relationship with a professional staff of the Procuring Entity who?
 - i) are directly or indirectly involved in the preparation of the Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract; or
 - ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner

acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.

- 3.4 A tenderer shall not be involved in corrupt, coercive, obstructive, collusive or fraudulent practice. A tenderer that is proven to have been involved any of these practices shall be automatically disqualified.
- 3.5 A Tenderer (either individually or as a JV member) shall not participate in more than one Tender, except for permitted alternative tenders. This includes participation as a subcontractor in other Tenders. Such participation shall result in the disqualification of all Tenders in which the firm is involved. A firm that is not a tenderer or a JV member may participate as a subcontractor in more than one tender. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender.
- 3.6 A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT 4.8. A Tenderer shall be deemed to have the nationality of a country if the Tenderer is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed subcontractors or sub-consultants for any part of the Contract including related Services.
- 3.7 Tenderer that has been debarred from participating in public procurement shall be ineligible to tender or be awarded a contract. The list of debarred firms and individuals is available from the website of PPRA www.ppra.go.ke.
- 3.8 Tenderers that are state-owned enterprises or institutions may be eligible to compete and be awarded a Contract(s) only if they are accredited by PPRA to be (i) a legal public entity of the state Government and/or public administration, (ii) financially autonomous and not receiving any significant subsidies or budget support from any public entity or Government, and (iii) operating under commercial law and vested with legal rights and liabilities similar to any commercial enterprise to enable it compete with firms in the private sector on an equal basis.
- 3.9 A Firms and individuals may be ineligible if their countries of origin (a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country, or (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country. A tenderer

shall provide such documentary evidence of eligibility satisfactory to the Procuring Entity, as the Procuring Entity shall reasonably request.

- 3.10 Foreign tenderers are required to source at least forty (40%) percent of their contract inputs (in supplies, subcontracts and labor) from national suppliers and contractors. To this end, a foreign tenderer shall provide in its tender documentary evidence that this requirement is met. Foreign tenderers not meeting this criterion will be automatically disqualified. Information required to enable the Procuring Entity determine if this condition is met shall be provided in for this purpose is be provided in "SECTION III - EVALUATION AND QUALIFICATION CRITERIA, Item 9".
- 3.11 Pursuant to the eligibility requirements of ITT 4.10, a tender is considered a foreign tenderer, if the tenderer is not registered in Kenya or if the tenderer is registered in Kenya and has less than 51 percent ownership by Kenyan Citizens. JVs are considered as foreign tenderers if the individual member firms are not registered in Kenya or if are registered in Kenya and have less than 51 percent ownership by Kenyan citizens. The JV shall not subcontract to foreign firms more than 10 percent of the contract price, excluding provisional sums.
- 3.12 The National Construction Authority Act of Kenya requires that all local and foreign contractors be registered with the National Construction Authority and be issued with a Registration Certificate before they can undertake any construction works in Kenya. Registration shall not be a condition for tender, but it shall be a condition of contract award and signature. A selected tenderer shall be given opportunity to register before such award and signature of contract. Application for registration with National Construction Authority may be accessed from the website www.nca.go.ke.
- 3.13 The Competition Act of Kenya requires that firms wishing to tender as Joint Venture undertakings which may prevent, distort or lessen competition in provision of services are prohibited unless they are exempt in accordance with the provisions of Section 25 of the Competition Act, 2010. JVs will be required to seek for exemption from the Competition Authority. Exemption shall not be a condition for tender, but it shall be a condition of contract award and signature. A JV tenderer shall be given opportunity to seek such exemption as a condition of award and signature of contract. Application for exemption from the Competition Authority of Kenya may be accessed from the website www.cak.go.ke
- 3.14 A Kenyan tenderer shall provide evidence of having fulfilled his/her tax obligations by producing a valid tax clearance certificate or tax exemption certificate issued by the Kenya Revenue Authority.

4. Eligible Goods, Equipment, and Services

- 4.1 Goods, equipment and services to be supplied under the Contract may have their origin in any country that is not eligible under ITT 3.9. At the Procuring Entity's request, Tenderers may be required to provide evidence of the origin of Goods, equipment and services.
- 4.2 Any goods, works and production processes with characteristics that have been declared by the relevant national environmental protection agency or by other competent authority as harmful to human beings and to the environment shall not be eligible for procurement.

5. Tenderer's Responsibilities

- 5.1 The tenderer shall bear all costs associated with the preparation and submission of his/her tender, and the Procuring Entity will in no case be responsible or liable for those costs.
- 5.2 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.
- 5.3 The Tenderer and any of its personnel or agents will be granted permission by the Procuring Entity to enter upon its premises and lands for the purpose of such visit. The Tenderer shall indemnify the Procuring Entity against all liability arising from death or personal injury, loss of or damage to property, and any other losses and expenses incurred as a result of the inspection.
- 5.4 The tenderer shall provide in the Form of Tender and Qualification Information, a preliminary description of the proposed work method and schedule, including charts, as necessary or required.

B. Contents of Tender Documents

6. Sections of Tender Document

- 6.1 The tender document consists of Parts 1, 2, and 3, which includes all the sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITT 8

PART 1 Tendering Procedures

Section I - Instructions to Tenderers (ITT)

Section II - Tender Data Sheet (TDS)

Section III - Evaluation and Qualification Criteria

Section IV - Tendering Forms

PART 2 Works Requirements

Section V – Drawings

Section VI - Specifications

Section VII - Bills of Quantities

PART 3 Conditions of Contract and Contract Forms

Section VIII - General Conditions of Contract (GCC)

Section IX - Special Conditions of Contract (SC) Section

X - Contract Forms

- 6.2 The Invitation to Tender Document (ITT) issued by the Procuring Entity is not part of the Contract documents.
- 6.3 Unless obtained directly from the Procuring Entity, the Procuring Entity is not responsible for the completeness of the Tender document, responses to requests for clarification, the minutes of the pre-Tender meeting (if any), or Addenda to the Tender document in accordance with ITT 8. In case of any contradiction, documents obtained directly from the Procuring Entity shall prevail.

The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document and to furnish with its Tender all information and documentation as is required by the Tender document.

7. Site Visit

- 7.1 The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the Site of the Required Services and its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for the Services. The costs of visiting the Site shall be at the Tenderer's own expense.

8. Pre-Tender Meeting

- 8.1 The Procuring Entity shall specify in the TDS if a pre-tender meeting will be held, when and where. The Procuring Entity shall also specify in the TDS if a pre-arranged pretender site visit will be held and when. The Tenderer's designated representative is invited to attend a pre-arranged pretender visit of the site of the works. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

- 8.2 The Tenderer is requested to submit any questions in writing, to reach the Procuring Entity not later than the period specified in the TDS before the meeting.
- 8.3 Minutes of the pre-Tender meeting and the pre-arranged pretender site visit of the site of the works, if applicable, including the text of the questions asked by Tenderers and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Tenderers who have acquired the Tender Documents in accordance with ITT 6.3. Minutes shall not identify the source of the questions asked.
- 8.4 The Procuring Entity shall also promptly publish anonym zed (no names) Minutes of the pre-Tender meeting and the pre-arranged pretender visit of the site of the works at the web page identified in the TDS. Any modification to the Tender Documents that may become necessary as a result of the pre-tender meeting and the pre-arranged pretender site visit, shall be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT 8 and not through the minutes of the pre-Tender meeting. Nonattendance at the pre-Tender meeting will not be a cause for disqualification of a Tenderer.

9. Clarification and amendments of Tender Documents

- 9.1 A Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address specified in the TDS or raise its enquiries during the pre-Tender meeting and the pre- arranged pretender visit of the site of the works if provided for in accordance with ITT 8.4. The Procuring Entity will respond in writing to any request for clarification, provided that such request is received no later than the period specified in the TDS prior to the deadline for submission of tenders. The Procuring Entity shall forward copies of its response to all tenderers who have acquired the Tender Documents in accordance with ITT 6.3, including a description of the inquiry but without identifying its source. If specified in the TDS, the Procuring Entity shall also promptly publish its response at the web page identified in the TDS. Should the clarification result in changes to the essential elements of the Tender Documents, the Procuring Entity shall amend the Tender Documents appropriately following the procedure under ITT 8.4.

10. Amendment of Tendering Document

- 10.1 At any time prior to the deadline for submission of Tenders, the Procuring Entity may amend the Tendering document by issuing addenda.
- 10.2 Any addendum issued shall be part of the tendering document and shall be communicated in writing to all who have obtained the tendering document from the Procuring Entity in accordance with ITT 6.3. The Procuring Entity shall also promptly publish the addendum on the Procuring Entity's web page in accordance with ITT 8.4.
- 10.3 To give prospective Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Procuring Entity

shall extend, as necessary, the deadline for submission of Tenders, in accordance with ITT 25.2 below.

C. Preparation of Tenders

11. Cost of Tendering

- 11.1 The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

12. Language of Tender

- 12.1 The Tender, as well as all correspondence and documents relating to the tender exchanged by the tenderer and the Procuring Entity, shall be written in the English Language. Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate and notarized translation of the relevant passages into the English Language, in which case, for purposes of interpretation of the Tender, such translation shall govern.

13. Documents Comprising the Tender

- 13.1 The Tender shall comprise the following:
- a) Form of Tender prepared in accordance with ITT 14;
 - b) Schedules including priced Bill of Quantities, completed in accordance with ITT 14 and ITT 16;
 - c) Tender Security or Tender-Securing Declaration, in accordance with ITT 21.1;
 - d) Alternative Tender, if permissible, in accordance with ITT 15;
 - e) Authorization: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 22.3;
 - f) Qualifications: documentary evidence in accordance with ITT 19 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted;
 - g) Conformity: a technical proposal in accordance with ITT 18;
 - h) Any other document required in the **TDS**.
- 13.2 In addition to the requirements under ITT 11.1, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, together with a copy of the proposed Agreement. The Tenderer shall chronologically serialize pages of all tender documents submitted.
- 13.3 The Tenderer shall furnish in the Form of Tender information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Tender.

14. Form of Tender and Schedules

- 14.1 The Form of Tender and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tendering

Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITT 20.3. All blank spaces shall be filled in with the information requested.

15. Alternative Tenders

- 15.1 Unless otherwise specified in the TDS, alternative Tenders shall not be considered.
- 15.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the TDS, and the method of evaluating different alternative times for completion will be described in Section III, Evaluation and Qualification Criteria.
- 15.3 Except as provided under ITT 13.4 below, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents must first price the Procuring Entity's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the Tenderer with the Winning Tender conforming to the basic technical requirements shall be considered by the Procuring Entity. When specified in the TDS, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the TDS, as will the method for their evaluating, and described in Section VII, Works' Requirements.

16. Tender Prices and Discounts

- 16.1 The prices and discounts (including any price reduction) quoted by the Tenderer in the Form of Tender and in the Bill of Quantities shall conform to the requirements specified below.
- 16.2 The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Tenderer shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Procuring Entity. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Tender, and provided that the Tender is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Tenderers will be added to the Tender price and the equivalent total cost of the Tender so determined will be used for price comparison.
- 16.3 The price to be quoted in the Form of Tender, in accordance with ITT 14.1, shall be the total price of the Tender, including any discounts offered.
- 16.4 The Tenderer shall quote any discounts and the methodology for their application in the Form of Tender, in accordance with ITT 14.1.
- 16.5 It will be specified in the TDS if the rates and prices quoted by the Tenderer are or are not subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of

Contract, except in cases where the contract is subject to fluctuations and adjustments, not fixed price. In such a case, the Tenderer shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Procuring Entity may require the Tenderer to justify its proposed indices and weightings.

16.6 Where tenders are being invited for individual lots (contracts) or for any combination of lots (packages), tenderers wishing to offer discounts for the award of more than one Contract shall specify in their Tender the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITT 16.4, provided the Tenders for all lots (contracts) are opened at the same time.

16.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 30 days prior to the deadline for submission of Tenders, shall be included in the rates and prices and the total Tender Price submitted by the Tenderer.

17. Currencies of Tender and Payment

17.1 Tenderers shall quote entirely in Kenya Shillings. The unit rates and the prices shall be quoted by the Tenderer in the Bill of Quantities, entirely in Kenya shillings. A Tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside Kenya shall device own ways of getting foreign currency to meet those expenditures.

18. Documents Comprising the Technical Proposal

18.1 The Tenderer shall furnish a technical proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Tender Forms, in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work's requirements and the completion time.

19. Documents Establishing the Eligibility and Qualifications of the Tenderer

19.1 Tenderers shall complete the Form of Tender, included in Section IV, Tender Forms, to establish Tenderer's eligibility in accordance with ITT 4.

19.2 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract the Tenderer shall provide the information requested in the corresponding information sheets included in Section IV, Tender Forms.

19.3 A margin of preference will not be allowed. Preference and reservations will be allowed, individually or in joint ventures. Applying for eligibility for Preference and reservations shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITT 33.1.

19.4 Tenderers shall be asked to provide, as part of the data for qualification, such information, including details of ownership, as shall be required to determine whether, according to the classification established by the Procuring Entity, a contractor or group of contractors qualifies for a margin of preference. Further the information will enable the Procuring Entity identify any actual or potential conflict of interest in relation to

- the procurement and/or contract management processes, or a possibility of collusion between tenderers, and thereby help to prevent any corrupt influence in relation to the procurement process or contract management.
- 19.5 The purpose of the information described in ITT 19.4 above overrides any claims to confidentiality which a tenderer may have. There can be no circumstances in which it would be justified for a tenderer to keep information relating to its ownership and control confidential where it is tendering to undertake public sector work and receive public sector funds. Thus, confidentiality will not be accepted by the Procuring Entity as a justification for a Tenderer's failure to disclose, or failure to provide required information on its ownership and control.
- 19.6 The Tenderer shall provide further documentary proof, information or authorizations that the Procuring Entity may request in relation to ownership and control which information on any changes to the information which was provided by the tenderer under ITT 6.3. The obligations to require this information shall continue for the duration of the procurement process and contract performance and after completion of the contract, if any change to the information previously provided may reveal a conflict of interest in relation to the award or management of the contract.
- 19.7 All information provided by the tenderer pursuant to these requirements must be complete, current and accurate as at the date of provision to the Procuring Entity. In submitting the information required pursuant to these requirements, the Tenderer shall warrant that the information submitted is complete, current and accurate as at the date of submission to the Procuring Entity.
- 19.8 If a tenderer fails to submit the information required by these requirements, its tender will be rejected. Similarly, if the Procuring Entity is unable, after taking reasonable steps, to verify to a reasonable degree the information submitted by a tenderer pursuant to these requirements, then the tender will be rejected.
- 19.9 If information submitted by a tenderer pursuant to these requirements, or obtained by the Procuring Entity (whether through its own enquiries, through notification by the public or otherwise), shows any conflict of interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process, then:
- i) if the procurement process is still ongoing, the tenderer will be disqualified from the procurement process,
 - ii) if the contract has been awarded to that tenderer, the contract award will be set aside,
 - iii) the tenderer will be referred to the relevant law enforcement authorities for investigation of whether the tenderer or any other persons have committed any criminal offence.
- 19.10 If a tenderer submits information pursuant to these requirements that is incomplete, inaccurate or out-of-date, or attempts to obstruct the verification process, then the consequences ITT 6.7 will ensue unless the tenderer can show to the reasonable satisfaction of the Procuring

Entity that any such act was not material, or was due to genuine error which was not attributable to the intentional act, negligence or recklessness of the tenderer.

20. Period of Validity of Tenders

- 20.1 Tenders shall remain valid for the Tender Validity period specified in the TDS. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Procuring Entity in accordance with ITT 24). A Tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.
- 20.2 In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 21.1, it shall also be extended for thirty (30) days beyond the deadline of the extended validity period. A Tenderer may refuse the request without forfeiting its Tender security. A Tenderer granting the request shall not be required or permitted to modify its Tender, except as provided in ITT 20.3.
- 20.3 If the award is delayed by a period exceeding the number of days to be specified in the TDS days beyond the expiry of the initial tender validity period, the Contract price shall be determined as follows:
- a) in the case of **fixed price** contracts, the Contract price shall be the tender price adjusted by the factor specified in the **TDS**;
 - b) in the case of **adjustable price** contracts, no adjustment shall be made; or in any case, tender evaluation shall be based on the tender price without taking into consideration the applicable correction from those indicated above.

21. Tender Security

- 21.1 The Tenderer shall furnish as part of its Tender, either a Tender-Securing Declaration or a Tender Security as specified in the TDS, in original form and, in the case of a Tender Security, in the amount and currency specified in the TDS. A Tender-Securing Declaration shall use the form included in Section IV, Tender Forms.
- 21.2 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security shall be a demand guarantee in any of the following forms at the Tenderer's option:
- a) an unconditional Bank Guarantee issued by reputable commercial bank); or
 - b) an irrevocable letter of credit;
 - c) a Banker's cheque issued by a reputable commercial bank; or
 - d) another security specified **in the TDS**,
- 21.3 If an unconditional bank guarantee is issued by a bank located outside Kenya, the issuing bank shall have a correspondent bank located in Kenya to make it enforceable. The Tender Security shall be valid for thirty (30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 20.2.
- 21.4 If a Tender Security or Tender-Securing Declaration is specified pursuant to ITT 19.1, any Tender not accompanied by a substantially

responsive Tender Security or Tender-Securing Declaration shall be rejected by the Procuring Entity as non-responsive.

21.5 If a Tender Security is specified pursuant to ITT 21.1, the Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer's signing the Contract and furnishing the Performance Security and any other documents required in the TDS. The Procuring Entity shall also promptly return the tender security to the tenderers where the procurement proceedings are terminated, all tenders were determined nonresponsive or a bidder declines to extend tender validity period.

21.6 The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security, and any other documents required in the TDS.

21.7 The Tender Security may be forfeited or the Tender-Securing Declaration executed:

- e) if a Tenderer withdraws its Tender during the period of Tender validity specified by the Tenderer on the Form of Tender, or any extension thereto provided by the Tenderer; or
- f) if the successful Tenderer fails to:
 - i) sign the Contract in accordance with ITT 50; or ii) furnish a Performance Security and if required in the **TDS**, and any other documents required in the **TDS**.

21.8 Where tender securing declaration is executed, the Procuring Entity shall recommend to the PPRA that PPRA debars the Tenderer from participating in public procurement as provided in the law.

21.9 The Tender Security or the Tender-Securing Declaration of a JV shall be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of tendering, the Tender Security or the Tender-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITT 4.1 and ITT 11.2.

21.10 A tenderer shall not issue a tender security to guarantee itself.

22. Format and Signing of Tender

22.1 The Tenderer shall prepare one original of the documents comprising the Tender as described in ITT 13 and clearly mark it "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 15, shall be clearly marked "ALTERNATIVE." In addition, the Tenderer shall submit copies of the Tender, in the number specified in the TDS and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2 Tenderers shall mark as "CONFIDENTIAL" all information in their Tenders which is confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.

- 22.3 The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation as specified in the TDS and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.
- 22.4 In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 22.5 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D. Submission and Opening of Tenders

23. Sealing and Marking of Tenders

- 23.1 Depending on the sizes or quantities or weight of the tender documents, a tenderer may use an envelope, package or container. The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the name and Reference number of the Tender, addressed to the Procuring Entity and a warning not to open before the time and date for Tender opening date. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:
- a) in an envelope or package or container marked "ORIGINAL", all documents comprising the Tender, as described in ITT 11; and
 - b) in an envelope or package or container marked "COPIES", all required copies of the Tender; and
 - c) if alternative Tenders are permitted in accordance with ITT 15, and if relevant:
 - i) in an envelope or package or container marked "ORIGINAL –ALTERNATIVE TENDER", the alternative Tender; and ii) in the envelope or package or container marked "COPIES- ALTERNATIVE TENDER", all required copies of the alternative Tender.

The inner envelopes or packages or containers shall:

- a) bear the name and address of the Procuring Entity.
- b) bear the name and address of the Tenderer; and
- c) bear the name and Reference number of the Tender.

If an envelope or package or container is not sealed and marked as required, the Procuring Entity will assume no responsibility for the misplacement or premature opening of the Tender. Tenders that are misplaced or opened prematurely will not be accepted.

24 Deadline for Submission of Tenders

24.1 Tenders must be received by the Procuring Entity at the address specified in the TDS and no later than the date and time also specified in the TDS. When so specified in the TDS, Tenderers shall have the option of submitting their Tenders electronically. Tenderers submitting Tenders electronically shall follow the electronic Tender submission procedures specified in the TDS.

24.2 The Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Documents in accordance with ITT 8, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended.

25 Late Tenders

25.1 The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of tenders, in accordance with ITT 24. Any Tender received by the Procuring Entity after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Tenderer.

26 Withdrawal, Substitution, and Modification of Tenders

26.1 A Tenderer may withdraw, substitute, or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITT 22.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be:

- a) prepared and submitted in accordance with ITT 22 and ITT 23 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
- b) received by the Procuring Entity prior to the deadline prescribed for submission of Tenders, in accordance with ITT 24.

26.2 Tenders requested to be withdrawn in accordance with ITT 26.1 shall be returned unopened to the Tenderers.

26.3 No Tender may be withdrawn, substituted, or modified in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer on the Form of Tender or any extension thereof.

27 Tender Opening

27.1 Except in the cases specified in ITT 23 and ITT 26.2, the Procuring Entity shall publicly open and read out all Tenders received by the deadline, at the date, time and place specified in the TDS, in the presence of Tenderers' designated representatives who chooses to

attend. Any specific electronic Tender opening procedures required if electronic Tendering is permitted in accordance with ITT 24.1, shall be as specified in the TDS.

- 27.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelopes with the corresponding Tender shall not be opened, but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.
- 27.3 Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Tender opening.
- 27.4 Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.
- 27.5 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the Tenderer and whether there is a modification; the total Tender Price, per lot (contract) if applicable, including any discounts and alternative Tenders; the presence or absence of a Tender Security or Tender-Securing Declaration, if required; and any other details as the Procuring Entity may consider appropriate.
- 27.6 Only Tenders, alternative Tenders and discounts that are opened and read out at Tender opening shall be considered further for evaluation. The Form of Tender and pages of the Bills of Quantities are to be initialed by the members of the tender opening committee attending the opening. The number of representatives of the Procuring Entity to sign shall be specified in the TDS.
- 27.7 At the Tender Opening, the Procuring Entity shall neither discuss the merits of any Tender nor reject any Tender (except for late Tenders, in accordance with ITT

25.1).

27.8 The Procuring Entity shall prepare minutes of the Tender Opening that shall include, as a minimum:

- a) the name of the Tenderer and whether there is a withdrawal, substitution, or modification;
- b) the Tender Price, per lot (contract) if applicable, including any discounts;
- c) any alternative Tenders;
- d) the presence or absence of a Tender Security, if one was required.
- e) number of pages of each tender document submitted.

27.9 The Tenderers' representatives who are present shall be requested to sign the minutes. The omission of a Tenderer's signature on the minutes shall not invalidate the

contents and effect of the minutes. A copy of the tender opening register shall be distributed to all Tenderers upon request.

E. Evaluation and Comparison of Tenders

28. Confidentiality

- 28.1 Information relating to the evaluation of Tenders and recommendation of contract award shall not be disclosed to Tenderers or any other persons not officially concerned with the Tender process until information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 46.
- 28.2 Any effort by a Tenderer to influence the Procuring Entity in the evaluation of the Tenders or Contract award decisions may result in the rejection of its tender.
- 28.3 Notwithstanding ITT 28.2, from the time of tender opening to the time of contract award, if a tenderer wishes to contact the Procuring Entity on any matter related to the tendering process, it shall do so in writing.

29. Clarification of Tenders

- 29.1 To assist in the examination, evaluation, and comparison of the tenders, and qualification of the tenderers, the Procuring Entity may, at its discretion, ask any tenderer for a clarification of its tender, given a reasonable time for a response. Any clarification submitted by a tenderer that is not in response to a request by the Procuring Entity shall not be considered. The Procuring Entity's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the tender shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Procuring Entity in the evaluation of the tenders, in accordance with ITT 33.
- 29.2 If a tenderer does not provide clarifications of its tender by the date and time set in the Procuring Entity's request for clarification, its Tender may be rejected.

30. Deviations, Reservations, and Omissions

- 30.1 During the evaluation of tenders, the following definitions apply:
 - a) "Deviation" is a departure from the requirements specified in the tender document;
 - b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the tender document; and
 - c) "Omission" is the failure to submit part or all of the information or documentation required in the Tender document.

31. Determination of Responsiveness

- 31.1 The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the tender itself, as defined in ITT 13.
- 31.2 A substantially responsive Tender is one that meets the requirements of the Tender document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, if accepted, would:
 - a) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
 - b) limit in any substantial way, inconsistent with the tender document, the Procuring Entity's rights or the tenderer's obligations under the proposed contract; or
 - c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders.

31.3 The Procuring Entity shall examine the technical aspects of the tender submitted in accordance with ITT 18, to confirm that all requirements of Section VII, Works' Requirements have been met without any material deviation, reservation or omission.

31.4 If a tender is not substantially responsive to the requirements of the tender document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

32. Non-material Non-conformities

32.1 Provided that a tender is substantially responsive, the Procuring Entity may waive any non-conformities in the tender.

32.2 Provided that a Tender is substantially responsive, the Procuring Entity may request that the tenderer submit the necessary information or documentation, within a reasonable period, to rectify nonmaterial non-conformities in the tender related to documentation requirements. Requesting information or documentation on such non- conformities shall not be related to any aspect of the price of the tender. Failure of the tenderer to comply with the request may result in the rejection of its tender.

32.3 Provided that a tender is substantially responsive, the Procuring Entity shall rectify quantifiable nonmaterial non-conformities related to the Tender Price. To this effect, the Tender Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component in the manner specified in the TDS.

33. Arithmetical Errors

33.1 The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.

33.2 Provided that the Tender is substantially responsive, the Procuring Entity shall handle errors on the following basis:

- a) Any error detected if considered a major deviation that affects the substance of the tender, shall lead to disqualification of the tender as non-responsive.
- b) Any errors in the submitted tender arising from a miscalculation of unit price, quantity, and subtotal and total bid price shall be considered as a major deviation that affects the substance of the tender and shall lead to disqualification of the tender as non-responsive. and
- c) if there is a discrepancy between words and figures, the amount in words shall prevail

33.3 Tenderers shall be notified of any error detected in their bid during the notification of a ward.

34. Currency provisions

34.1 Tenders will priced be in Kenya Shillings only. Tenderers quoting in currencies other than in Kenya shillings will be determined non-responsive and rejected.

35. Margin of Preference and Reservations

35.1 No margin of preference shall be allowed on contracts for small works.

35.2 Where it is intended to reserve the contract to specific groups under Small and Medium Enterprises, or enterprise of women, youth and/or persons living with disability, who are appropriately registered as such by the authority to be

specified in the TDS, a procuring entity shall ensure that the invitation to tender specifically indicates that only businesses/firms belonging to those specified groups are the only ones eligible to tender. Otherwise if no so stated, the invitation will be open to all tenderers.

36. Nominated Subcontractors

36.1 Unless otherwise stated in the TDS, the Procuring Entity does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Procuring Entity.

36.2 Tenderers may propose subcontracting up to the percentage of total value of contracts or the volume of works as specified in the TDS. Subcontractors proposed by the Tenderer shall be fully qualified for their parts of the Works.

36.3 The subcontractor's qualifications shall not be used by the Tenderer to qualify for the Works unless their specialized parts of the Works were previously designated by the Procuring Entity in the TDS as can be met by subcontractors referred to hereafter as 'Specialized Subcontractors', in which case, the qualifications of the Specialized Subcontractors proposed by the Tenderer may be added to the qualifications of the Tenderer.

37. Evaluation of Tenders

37.1 The Procuring Entity shall use the criteria and methodologies listed in this ITT and Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Procuring Entity shall determine the Best Evaluated Tender in accordance with ITT 40.

37.2 To evaluate a Tender, the Procuring Entity shall consider the following:

- a) price adjustment due to discounts offered in accordance with ITT 16;
- b) converting the amount resulting from applying (a) and (b) above, if relevant, to a single currency in accordance with ITT 39;
- c) price adjustment due to quantifiable nonmaterial non-conformities in accordance with ITT 30.3; and
- d) any additional evaluation factors specified **in the TDS** and Section III, Evaluation and Qualification Criteria.

37.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be considered in Tender evaluation.

37.4 In the case of multiple contracts or lots, Tenderers shall be allowed to tender for one or more lots and the methodology to determine the lowest evaluated cost of the lot (contract) combinations, including any discounts offered in the Form of Tender, is specified in Section III, Evaluation and Qualification Criteria.

38. Comparison of Tenders

38.1 The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 38.2 to determine the Tender that has the lowest evaluated cost.

39. Abnormally Low Tenders

39.1 An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as

to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price or that genuine competition between Tenderers is compromised.

39.2 In the event of identification of a potentially Abnormally Low Tender, the Procuring Entity shall seek written clarifications from the Tenderer, including detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Tender document.

39.3 After evaluation of the price analyses, in the event that the Procuring Entity determines that the Tenderer has failed to demonstrate its capability to perform the Contract for the offered Tender Price, the Procuring Entity shall reject the Tender.

40. Abnormally High Tenders

40.1 An abnormally high price is one where the tender price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Procuring Entity is concerned that it (the Procuring Entity) may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between Tenderers is compromised.

40.2 In case of an abnormally high tender price, the Procuring Entity shall make a survey of the market prices, check if the estimated cost of the contract is correct and review the Tender Documents to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high tenders. The Procuring Entity may also seek written clarification from the tenderer on the reason for the high tender price. The Procuring Entity shall proceed as follows:

- i) If the tender price is abnormally high based on wrong estimated cost of the contract, the Procuring Entity may accept or not accept the tender depending on the Procuring Entity's budget considerations.
- ii) If specifications, scope of work and/or conditions of contract are contributory to the abnormally high tender prices, the Procuring Entity shall reject all tenders and may retender for the contract based on revised estimates, specifications, scope of work and conditions of contract, as the case may be.

40.3 If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (often due to collusion, corruption

or other manipulations), the Procuring Entity shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise, before retendering.

41. Unbalanced and/or Front-Loaded Tenders

41.1 If in the Procuring Entity's opinion, the Tender that is evaluated as the lowest evaluated price is seriously unbalanced and/or front loaded, the Procuring Entity may require the Tenderer to provide written clarifications. Clarifications may include detailed price analyses to demonstrate the consistency of the tender prices with the scope of works, proposed methodology, schedule and any other requirements of the Tender document.

41.2 After the evaluation of the information and detailed price analyses presented by the Tenderer, the Procuring Entity may as appropriate:

- a) accept the Tender; or
- b) require that the total amount of the Performance Security be increased at the expense of the Tenderer to a level not exceeding a 30% of the Contract Price; or
- c) agree on a payment mode that eliminates the inherent risk of the Procuring Entity paying too much for undelivered works; or
- d) reject the Tender,

42. Qualifications of the Tenderer

- 42.1** The Procuring Entity shall determine to its satisfaction whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.
- 42.2** The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 19. The determination shall not take into consideration the qualifications of other firms such as the Tenderer's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Subcontractors if permitted in the Tender document), or any other firm(s) different from the Tenderer.
- 42.3** An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in disqualification of the Tender, in which event the Procuring Entity shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated price to make a similar determination of that Tenderer's qualifications to perform satisfactorily.
- 42.4** An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price.
- 42.5** In the event of identification of a potentially Abnormally Low Tender, the Procuring Entity shall seek written clarifications from the Tenderer, including detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Tender document.
- 42.6** After evaluation of the price analyses, if the Procuring Entity determines that the Tenderer has failed to demonstrate its capability to perform the Contract for the offered Tender Price, the Procuring Entity shall reject the Tender.

43. Best Evaluated Tender

43.1 Having compared the evaluated prices of Tenders, the Procuring Entity shall determine the Best Evaluated Tender. The Best Evaluated Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be:

- a) Most responsive to the Tender document; and
- b) the lowest evaluated price.

44. Procuring Entity's Right to Accept Any Tender, and to Reject Any or All Tenders.

44.1 The Procuring Entity reserves the right to accept or reject any Tender and to annul the Tender process and reject all Tenders at any time prior to Contract Award, without thereby incurring any liability to Tenderers. In case of annulment, all Tenderers shall be notified with reasons and all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.

F. Award of Contract

45. Award Criteria

45.1 The Procuring Entity shall award the Contract to the successful tenderer whose tender has been determined to be the Lowest Evaluated Tender.

46. Notice of Intention to enter into a Contract

46.1 Upon award of the contract and Prior to the expiry of the Tender Validity Period the Procuring Entity shall issue a Notification of Intention to Enter into a Contract / Notification of award to all tenderers which shall contain, at a minimum, the following information:

- a) the name and address of the Tenderer submitting the successful tender;
- b) the Contract price of the successful tender;
- c) a statement of the reason(s) the tender of the unsuccessful tenderer to whom the letter is addressed was unsuccessful, unless the price information in (c) above already reveals the reason;
- d) the expiry date of the Standstill Period; and
- e) instructions on how to request a debriefing and/or submit a complaint during the standstill period;

47. Standstill Period

47.1 The Contract shall not be signed earlier than the expiry of a Standstill Period of 14 days to allow any dissatisfied tender to launch a complaint. Where only one Tender is submitted, the Standstill Period shall not apply.

47.2 Where a Standstill Period applies, it shall commence when the Procuring Entity has transmitted to each Tenderer the Notification of Intention to Enter into a Contract with the successful Tenderer.

48. Debriefing by the Procuring Entity

48.1 On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 46, an unsuccessful tenderer may make a written request to the Procuring Entity for a debriefing on specific issues or concerns

regarding their tender. The Procuring Entity shall provide the debriefing within five days of receipt of the request.

- 48.2** Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.

49. Letter of Award

- 49.1** Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 42.1, upon addressing a complaint that has been filed within the Standstill Period, the Procuring Entity shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21days of the date of the letter.

50. Signing of Contract

- 50.1** Upon the expiry of the fourteen days of the Notification of Intention to enter into contract and upon the parties meeting their respective statutory requirements, the Procuring Entity shall send the successful Tenderer the Contract Agreement.
- 50.2** Within fourteen (14) days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and return it to the Procuring Entity.
- 50.3** The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period

51. Appointment of Adjudicator

- 51.1** The Procuring Entity proposes the person named in the TDS to be appointed as Adjudicator under the Contract, at the hourly fee specified in the TDS, plus reimbursable expenses. If the Tenderer disagrees with this proposal, the Tenderer should so state in his Tender. If, in the Letter of Acceptance, the Procuring Entity does not agree on the appointment of the Adjudicator, the Procuring Entity will request the Appointing Authority designated in the Special Conditions of Contract (SCC) pursuant to Clause 23.1 of the General Conditions of Contract (GCC), to appoint the Adjudicator.

52. Performance Security

- 52.1** Within twenty-one (21) days of the receipt of the Letter of Acceptance from the Procuring Entity, the successful Tenderer shall furnish the Performance Security and, any other documents required in the TDS, in accordance with the General Conditions of Contract, subject to ITT 40.2 (b), using the Performance Security and other Forms included in Section X, Contract Forms, or another form acceptable to the Procuring Entity. A foreign institution providing a bank guarantee shall have a correspondent financial institution located in Kenya, unless the Procuring Entity has agreed in writing that a correspondent bank is not required.
- 52.2** Failure of the successful Tenderer to submit the above-mentioned Performance Security and other documents required in the TDS, or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the Tenderer offering the next Best Evaluated Tender.

52.3 Performance security shall not be required for contracts estimated to cost less than Kenya shillings five million shillings.

53. Publication of Procurement Contract

53.1 Within fourteen days after signing the contract, the Procuring Entity shall publish the awarded contract at its notice boards and websites; and on the Website of the Authority. At the minimum, the notice shall contain the following information:

- a) name and address of the Procuring Entity;
- b) name and reference number of the contract being awarded, a summary of its scope and the selection method used;
- c) the name of the successful Tenderer, the final total contract price, the contract duration.
- d) dates of signature, commencement and completion of contract;
- e) names of all Tenderers that submitted Tenders, and their Tender prices as read out at Tender opening.

54. Procurement Related Complaints and Administrative Review

54.1 The procedures for making Procurement-related Complaints are as specified in the TDS.

54.2 A request for administrative review shall be made in the form provided under contract forms.

Section II - Tender Data Sheet (TDS)

The following specific data shall complement, supplement, or amend the provisions in the Instructions to Tenderers (ITT). Whenever there is a conflict, the provisions herein shall prevail over those in ITT.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	A. General
ITT 1.1	The name of the contract is CONSTRUCTION OF MBUGITI IRRIGATION PROJECT, GATANGA SUB-COUNTY – MURANG'A COUNTY: TENDER NO. MWSDI/ SDI /ONT/020/2023-2024
	The Information made available on competing firms is as follows: Not Applicable
ITT 2.4	The firms that provided consulting services for the contract being tendered for are: Not Applicable

ITT 3.1	Maximum number of members in the Joint Venture (JV) shall be: (2) TWO
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
B. Contents of Tender Document	
8.1	(A) Pre-Tender conference [insert "shall" or "shall not"] take place at the following date, time and place: Date: ____ N/A _____ Time: ____ N/A _____ Place: ____ N/A _____ (B) A pre-arranged pretender visit of the site of the works shall take place at the following date, time and place: Date: 21st May, 2024 Time: 11 00hrs Place: _SITE: MBUGITI IRRIGATION PROJECT, GATANGA SUB-COUNTY – MURANG'A COUNTY NB Pre-site visit is COMPULSORY

	One (1) technical person with a minimum qualification of a Diploma in Civil/Agricultural/Water/Electrical Engineering or equivalent shall only represent one (1) company per Tender. The individual MUST bring along the following: 1.Original ID/Passport and a certified copy 2.Original introductory letter bearing the Company letterhead and an Official Stamp authorizing them to represent them in the specific pre-tender site visit. The letter shall be duly signed. Photocopies or any other media shall not be accepted. 3.Certified copy of Diploma/Higher Diploma/Degree Certificate 4.Certified copy of Registration Certificate and proof of current subscription by Engineers Board of Kenya (EBK)/Kenya Engineering Technology Registration Board (KETRB)/Institute of Engineering Technologists and Technicians (IET) All the above documents shall be retained by the procuring entity and may be verified later for authenticity and will form part of Evaluation Criteria
ITT 8.2	The Tenderer will submit any questions in writing, to reach the Procuring Entity not later than 7 DAYS TO CLOSING DAY

ITT 8.4	The Procuring Entity's website where Minutes of the pre-Tender meeting and the pre-arranged pretender site visit will be published is www.water.go.ke
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS

ITT 9.1	For Clarification of Tender purposes, for obtaining further information and for purchasing tender documents, the Procuring Entity's address is: Principal Secretary, State Department for Irrigation P.O. BOX 49720-00100 Nairobi, ps@irrigationkenya.go.ke or procurement@irrigationkenya.go.ke; Head of Supply Chain Management Services, Maji House 3rd floor Room 316. 1.Name of procuring entity; Ministry of Water, Sanitation and Irrigation, State Department for Irrigation 2.Physical address for hand Courier Delivery; Tender Box; Ground Floor City; Nairobi Street Name; Ngong Road Building; Maji House Floor Number; 3rd Floor, Room 316 3. Postal Address; 49720-00100, Nairobi 4. Insert name: A. O Nyambeche
ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS

	5. Insert telephone number and e-mail address of the officer to be contacted. TEL: +254 02 27116103 EXT. 42164 <i>ps@irrigation.go.ke or procurement@irrigationkenya.go.ke</i>
C. Preparation of Tenders	
ITT 12.1	The Tender shall be written in the English Language.
ITP 13.1 (h)	a) The tenderers MUST submit the Following Additional Documents in its tender not already listed in ITT 13.1 should include the following: - i) Evidence of at least three (3) contracts of similar works done in the past three years from different organization, proof of evidence shall be certified copies of award and satisfactory completion certificate for the last three (3) years (2020/2021/2022).; ii) List of equipment proposed for the works (provide proof of ownership, lease or hire) iii) List of proposed personnel, signed cv's, professional certificates, and clear proposed position /tasks for each; iv) Copies of audited financial statements for the last three (3) years (2021/2022/2023) showing annual turnover of 200 Million for each year and approved & certified by CPA-K company with current practicing license.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	v) Duly filled and signed Buy Kenya Build Kenya Forms (a) & (b) for all material locally manufactured and proof of source in the format provided in accordance with ITT 3.7. vi) the tender should be submitted in the required format and serialized in accordance with section 74(1)(i) of the Act; vii) clear work program/plan for the implementation and Gantt Chart

ITT 13.1(g)	The tenderer must provide the following documentary evidence to Conformity of Preliminary Requirements with the tender documents a) Copy of Registration /Incorporation Certificate; b) Valid copy of recent (less than a year) CR 12 c) Valid copy of business permit from the county government d) Valid copy of a valid NCA certificate and current practicing license (NCA 4 and above) Water works contractor in accordance with ITT 3.12. e) A copy of a valid tax compliance certificate or valid tax exemption certificate issued by the Kenya Revenue Authority in accordance with ITT 3.14.
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
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	f) The power of attorney duly signed by the person lawfully Authorized in the format provided accordance with section 74(1)(d) of the PPADR 2020 & ITT 22.3. g) dully filled, stamped and signed Qualification Forms -1 to 3 in the format provided; h) dully filled, stamped and signed Tenders' Qualification Without Prequalification in the format provided; i) dully filled, stamped and signed Tenderer's eligibility-confidential business questionnaire in the format provided; j) dully filled, stamped and signed Forms SD 1 (non debarment), SD2 (self-declaration that the person/tenderer will not engage in any corrupt or fraudulent practice and form on declaration and commitment to the code of ethics. k) dully filled, stamped and signed Letter of Bid/Form of Tender In the Company Letterhead in the format provided l) For those tendering as joint venture; shall include a copy of the Joint Venture Agreement entered into by all members m) Must attach proof to buy locally manufactured goods
ITT 13.2	In case of Joint Venture tenderers shall submit the Following Additional Documents In a) A JV shall include a copy of the Joint Venture Agreement entered into by all members.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	b) Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, c) a copy of the proposed JV Agreement signed by all members. d)The Tenderer shall chronologically serialize pages of all tender documents submitted in accordance with section 74(1)(i) of the PPADA 2015. e) A successful JV tenderer shall submit a Performance Security of (10%) ten per cent of the contract amount before signing of the contract
ITT 15.1	Alternative Tenders shall not be considered.
ITT 15.2	Alternative times for completion shall not be, permitted.
ITT 15.3	Alternative Technical Solutions Shall Not Be Permitted.
ITT 16.5	The prices quoted by the Tenderer shall be FIXED
ITT 20.1	Tenders shall remain valid for the Tender Validity period for 150 days.

ITT 20.3 (a)	(a) The delayed to exceeding ____ N/A number of days.
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	(b) The Tender price shall be adjusted by the following percentages of the tender price: (i) By ____ N/A ____% of the local currency portion of the Contract price adjusted to reflect local inflation during the period of extension, and (ii) By N/A ____% the foreign currency portion of the Contract price adjusted to reflect the international inflation during the period of extension.
ITT 21.1	A tender security of (2%) two percent of the tender amount in Kenya shillings, from a Reputable Bank or an insurance Company authorized by PPRA. A Tender Securing Declaration shall be required for all tenderers submitting for small and micro-enterprises or enterprises owned by women, youth, persons with disabilities and other disadvantaged groups in the prescribed format.

ITT 21.2 (d)	Another Security specified in the TDS, A successful tenderer shall submit a performance security of (10%) ten per cent of the contract amount before signing of the contract.
ITT 21.5	On the performance other documents required shall be as per a) ITT 13.1 (h) b) ITT 13.2

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 22.1	In addition to the original copy of the Tender, the number of copies is (1) clearly marked "COPY." Which must be a replica of the original
ITT 22.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of a Power of Attorney form in the prescribed format in company letter head .
D. Submission and Opening of Tenders	

ITT 24.1	a) . Ministry of Water, Sanitation and Irrigation PS State Department for Irrigation P.O. Box 49720-00100, Nairobi Tender Box; Ground floor or 3rd Floor, Room 316 City; Nairobi Street Name; Ngong Road Building; Maji House Community Area b) Tenderers shall NOT submit their Tenders electronically.
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ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
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ITT 27.1	The Tender opening shall take place at the time and the address for Opening of Tenders provided below: 1. PS State Department for Irrigation P.O. Box 49720-00100, Nairobi 2. Tender Box; Ground floor or Floor Number ;3rd Floor, Room 316 City; Nairobi Street Name; Ngong Road Building; Maji House Community Area 3. Date and time of tender opening: 29th May, 2024 at 1100hrs
ITT 27.6	The number of representatives of the Procuring Entity to sign (Tender opening committee members).
E. Evaluation, and Comparison of Tenders	
ITT 32.3	The adjustment shall be based on the "average" price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Procuring Entity shall use its best estimate. N/A

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 33.1	No correction of errors shall be done, as per section 82 of the PPADA 2015
ITT 35.2	The invitation to tender is extended to all including specific groups under Small and Medium Enterprises, or enterprise of women, youth and/or persons living with disability, who are appropriately registered with The National Treasury and that all businesses/firms belonging to those specified groups are also eligible to tender.
ITT 36.1	At this time, the Procuring Entity does not intend to execute certain specific Parts of the Works by subcontractors selected in advance.
ITT 36.2	Contractor's may propose subcontracting: Maximum percentage of subcontracting permitted is: 10% of the total contract amount. Tenderers planning to subcontract more that 10% of total volume of work shall specify, in the Form of Tender, the activity (ies) or parts of the works to be subcontracted along with complete details of the subcontractors and their qualification and experience.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
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ITT 36.3	[Indicate N/A if not applicable] The parts of the Works for which the Procuring Entity permits Tenderers to propose Specialized Subcontractors are designated as follows: _____ N/A For the above-designated parts of the Works that may require Specialized Subcontractors, the relevant qualifications of the proposed Specialized Subcontractors will be added to the qualifications of the Tenderer for the purpose of evaluation.
ITT 37.2 (d)	Additional requirements apply. These are detailed in the evaluation criteria in Section III, Evaluation and Qualification Criteria.
ITT 51.1	The person named to be appointed as Adjudicator is ____ Chartered Institute of Arbitrators (CIArb) _of _____Nairobi Branch_____ (pride tel. no. full postal and email addresses) at an hourly fee of Shs. _____as negotiated_____ per day.
ITT 52.2	Other _____ documents _____ required _____ are _____ N/A _____
	Performance Security
ITT 52.1	A successful tenderer shall submit a performance security equivalent to (10%) ten per cent of the contract amount from a Reputable Bank Only before signing of the contract in line with section 142(1) of the PPADA 2015.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
54	Procurement Related Complaints
ITT 54.1	The procedures for making Procurement-related Complaints are detailed in the “regulations” available from the PPRA website www.ppra.go.ke Or complaints @ppra.go.ke.

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

1. General Provisions

Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the Kenya Shilling equivalent using the rate of exchange determined as follows:

- a) For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted) was originally established.
- b) Value of single contract - Exchange rate prevailing on the date of the contract signature.
- c) Exchange rates shall be taken from the publicly available source identified in the ITT 14.3. Any error in determining the exchange rates in the Tender may be corrected by the Procuring Entity.

This section contains the criteria that the Employer shall use to evaluate tender and qualify tenderers. No other factors, methods or criteria shall be used other than specified in this tender document. The Tenderer shall provide all the information requested in the forms included in Section IV, Tendering Forms. The Procuring Entity should use **the Standard Tender Evaluation Document for Goods and Works** for evaluating Tenders.

Evaluation and contract award Criteria

The Procuring Entity shall use the criteria and methodologies listed in this Section to evaluate tenders and arrive at the Lowest Evaluated Tender. The tender that (i) meets the qualification criteria, (ii) has been determined to be substantially responsive to the Tender Documents, and (iii) is determined to have the Lowest Evaluated Tender price shall be selected for award of contract.

2. Preliminary and Technical examination for Determination of Responsiveness

The Procuring Entity will start by examining all tenders to ensure they meet in all respects the eligibility criteria and other requirements in the ITT, and that the tender is complete in all aspects in meeting the requirements of "Part 2 – Procuring Entity's Works Requirements", including checking for tenders with unacceptable errors, abnormally low tenders, abnormally high tenders and tenders that are front loaded.

The Standard Tender Evaluation Report Document for Goods and Works for evaluating Tenders provides very clear guide on how to deal with review of these requirements. Tenders that do not pass the Preliminary Examination will be considered irresponsive and will not be considered further.

[The Procuring Entity will provide the preliminary evaluation criteria. To facilitate, a template may be attached or clearly described all information and list of documentation to be submitted by Tenderers to enable preliminary evaluation of the Tender]

PRELIMINARY EVALUATION CRITERIA

The tenderer **MUST** provide the following documentary evidence to Conformity of preliminary evaluation requirements for it to proceed to the next stage of technical evaluation. The criteria will be **(CRITERIA YES/NO);**

1. Copy of Registration /Incorporation Certificate;

2. Copy of recent (less than a year) CR 12
3. Copy of valid business permit from the county government
4. Copy of a valid NCA certificate and current practicing license (NCA 4 and above) Water works contractor in accordance with ITT 3.12.
5. A copy of a valid tax compliance certificate or valid tax exemption certificate issued by the Kenya Revenue Authority in accordance with ITT 3.14.
6. The Power of Attorney duly signed by the person lawfully Authorized in the format provided accordance with section 74(1)(d) of the PPADR 2020 & ITT 22.3.
7. Dully filled, stamped and signed Qualification Forms -1 to 3 in the format provided;
8. Dully filled, stamped and signed Tenders' Qualification Without Prequalification in the format provided;
9. dully filled, stamped and signed Tenderer's eligibility-confidential business questionnaire in the format provided;
10. Dully filled, stamped and signed Form SD1(non-debarment), SD2 (self-declaration that the person/tenderer will not engage in any corrupt or fraudulent practice) and form on declaration and commitment to the code of ethics in the format provided;
11. Dully filled, stamped and signed Letter of Bid/Form of Tender in the Company Letterhead in the format provided
12. For those tendering as joint venture shall include a copy of the Joint Venture Agreement entered into by all members
13. Must attach proof to buy locally manufactured goods
14. Must fill the bill of quantities in the format provided (Incomplete BoQs will be rejected)

15. Must submit tender security of 2% of the tender sum valid 30 days beyond the bid/tender validity period.
16. The bidder must serialize all the pages of each bid submitted.

NOTES ON THE TECHNICAL EVALUATION CRITERIA.

The tenderer must provide the following documentary evidence to Conformity of technical evaluation requirements with the tender documents and shall provide details of the proposed personnel and their experience records in the relevant forms included in section iv bidding forms

	Position	No	Qualification Requirement	Document to Be Completed By Tenderer	For Procuring Entity's Use (Qualification Met Or Not Met)
15.1	Project Manager	1	• A BSc or BA degree from a recognized University • General experience as project manager in similar work for five (5) years • Specific training as a project manager • Relevant total work experience for five (5) years to carry out this specific assignment • Participation in more than three (3) Number projects of similar nature	Attach certified, stamped and signed proof (certificates),	Must meet
Must submit CV for the proposed project manager who should have at least five (5) years of relevant experience and qualification					
Must submit CV for the proposed Site agent who should have at least three (3) years of relevant experience and qualification					

15.2	Site Agent	1	• BSc Agricultural engineering, Civil Engineering, water engineering or equivalent • Registration as a professional Engineer by EBK • general experience as a building and water works site agent in similar work for at least three (3) years • Specific experience and training as a contractor • relevant total work experience for five (3) years to carry out this specific assignment participation in more than three (3) Number projects of similar nature	Attach certified, stamped and signed proof (certificates), Registration cert by EBK	Must meet
	Position	No	Qualification Requirement	Document to Be Completed By Tenderer	For Procuring Entity's Use (Qualification Met Or Not Met)

15.3	Surveyor	1	• BSc Survey, Geospatial engineering or equivalent • Registration by ISK • general experience as a surveyor in similar work for four (4) years • Specific experience and training as a surveyor • relevant total work experience for four (4) years to carry out this specific assignment	Attach certified, stamped and signed proof (certificates), Registration cert by ISK	Must meet
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			□ participation in more than three (3) Number projects of similar nature		
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Must submit CV for the proposed surveyor who should have at least four (4) years of relevant experience and qualification

15.4	Foreman	1	• Foreman Certificate in construction projects or equivalent • (with recommendation letters) • general experience as a foreman in similar work for three (3) years • Specific experience and training as a foreman relevant total work experience for five (3) years to carry out this specific assignment • participation in more than three (3) Number projects of similar nature	Attach Certified, stamped and signed proof (certificates)	Must meet
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15.9 **Other conditions for the successful bidder**

1. Provide a certificate of insurance cover for all personnel of following policy; contractual liability policy `copy of workman's compensation certificate; public liability insurance policy for employees and wiba policy.
2. The bidder is required to deploy employees who are able to communicate in English and Kiswahili.
3. The deployed employees should be of age bracket 18-35 years (the youth bracket).
4. The bidder shall employ workers who are trained and have quality experience in construction of building and water works.
5. The deployed employees shall at all times wear company labelled uniforms /protective gear and masks
6. The deployed employees shall at all times wear staff identification cards bearing their names.
7. The deployed employees shall report at the agreed times and as from time to time directed by the caretaker.

16 EQUIPMENT

The bidder/tenderers must demonstrate that it will have access to the key equipment listed hereafter and shall provide details of the proposed items of equipment using the relevant forms included in section iv bidding forms

s/no	Equipment type and characteristics	Minimum number required	Remarks (indicate owned, leased or rented)	For Procuring Entity's Use (Qualification Met or Not Met)
1	Transport vehicles – pickup/trucks	2	Attach proof	Must meet
2	Tipper	2	Attach proof	Must meet
3	Excavator	1	Attach proof	Must meet
4	Bulldozer	1	Attach proof	Must meet
5	Roller	1	Attach proof	Must meet
6	Back Hoe Loader	1	Attach proof	Must meet
7	Concrete Mixer	2	Attach proof	Must meet
8	Water Bowser	1	Attach proof	Must meet
9	Poker Vibrator	1	Attach proof	Must meet

TECHNICAL EVALUATION CRITERIA

No.	Parameter			Maximum Score
1	Relevant Experience Experience as prime contractor in the construction of at least one project of a similar nature and complexity equivalent to the works in the last five years of value as follows: Equal or over 150million Equal or over 90million Equal or over 30million Below 30 million			 20 10 5 0
2	Equipment Back hoe loader, Excavator, Bulldozer, Tipper, Roller, pick up, water bowser, Concrete mixer, poker vibrator owned (Max 20 marks) 50% owned and lease leased 50% (Max 15 marks) 100% leased (Max 10 marks) Proof of ownership Must be provided i.e., Logbooks, lease agreements			 0-20 0-15 0-10
3	Key Personnel Project manager	Qualification A BSc or BA degree from a recognized University	Relevant Experience	Max-Marks 10

				5-10years 1-5years	5 3
		Site Agent	BSc. Agricultural Engineering, Civil Engineering or equivalent Degree HnD Diploma		10 8 6
			Experience	5-10years	3
				1-5years	2
		Surveyor	Degree Diploma		6 3
			Experience	5-10years 1-5years	3 2
		Foreman	Diploma Certificate		2 1
			Experience	1-3years	1
		4	Financial Capacity	Audited Accounts – Financial capability of the firm based on information provided in the last 3 years audited account	5
				Line of credit of over 50 Million	5

Annual volume (turn over) of construction work for the successful tenderer in any of the last 3 years shall be over Kshs. 200 Million	5
Proposed program (Work methodology and cash schedule)	5
TOTAL	100%

Only Tenderers who score 70% and above in the Technical evaluation will proceed to financial evaluation. Those that do not meet the minimum score will be dropped at this stage.

3. Tender Evaluation (ITT 35) Price evaluation: in addition to the criteria listed in ITT 35.2

(a) – (c) the following criteria shall apply:

- i) **Alternative Completion Times**, if permitted under ITT 13.2, will be evaluated as follows:
.....N/A.....
- ii) **Alternative Technical Solutions** for specified parts of the Works, if permitted under ITT 13.4, will be evaluated as follows:N/A.....
- iii) **Other Criteria;**
if permitted under ITT 35.2(d)...N/A.....

4. Multiple Contracts

Multiple contracts will not be permitted in accordance with ITT 35.4. Tenderers are evaluated and the lowest evaluated tenderer identified. The Procuring Entity will select one of the two Options listed below for award of Contracts.

OPTION 1

- i) If a tenderer wins only one Lot, the tenderer will be awarded a contract for that Lot, provided the tenderer meets the Eligibility and Qualification Criteria for that Lot.
- ii) If a tenderer wins more than one Lot, the tender will be awarded contracts for all won Lots, provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the Lots. The tenderer will be awarded the combination of Lots for which the tenderer qualifies and the others will be considered for award to second lowest the tenderers.

OPTION 2

The Procuring Entity will consider all possible combinations of won Lots [contract(s)] and determine the combinations with the lowest evaluated price. Tenders will then be awarded to the Tenderer or Tenderers in the combinations provided the tenderer meets the aggregate Eligibility and Qualification Criteria for all the won Lots.

5. Alternative Tenders (ITT 13.1)

An alternative if permitted under ITT 13.1, will be evaluated as follows: The Procuring Entity shall NOT consider Tenders offered for alternatives as specified in Part 2- Works Requirements. Only the technical alternatives, if any, of the Tenderer with the Best Evaluated Tender conforming to the basic technical requirements shall be considered by the Procuring Entity.

6. Margin of Preference is not applicable

7. Post qualification and Contract award (ITT 39), more specifically,

- a) In case the tender was subject to post-qualification, the contract shall be awarded to the lowest evaluated tenderer, subject to confirmation of pre-qualification data, if so required.

- b) In case the tender was not subject to post-qualification, the tender that has been determined to be the lowest evaluated tenderer shall be considered for contract award, subject to meeting each of the following conditions.
- i) The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction of Kenyan Shillings. |
 - ii) Minimum average annual construction turnover of 2.5% of the total contract sum or equivalent calculated as total certified payments received for contracts in progress and/or completed within the last three (3) years. (2020/2021/2022).
 - iii) At least **3 Number** contract(s) of a similar nature executed within Kenya, or the East African Community or abroad, that have been satisfactorily and substantially completed as a prime contractor, or joint venture member or sub-contractor each of minimum value of 2.5% or equivalent calculated as total certified payments received for contracts in progress and/or completed within the last three (3) years
 - iv) Contractor's Representative and Key Personnel, which are specified as per the provided schedule 15 (personnel) and forms in section iv
 - v) Contractors key equipment listed on the table "Contractor's Equipment" below and more specifically listed as per the provided schedule 16 (equipment) and forms in section iv other conditions depending on their seriousness.
 - a) History of non-performing contracts:
Tenderer and each member of JV in case the Tenderer is a JV, shall demonstrate that non-performance of a contract did not occur because of the default of the Tenderer, or the member of a JV in the in the last three (3) years) (2020/2021/2022). The required information shall be furnished in the appropriate form.
 - b) Pending Litigation
Financial position and prospective long-term profitability of the Single Tenderer, and in the case the Tenderer is a JV, of each member of the JV, shall remain sound according to criteria established with respect to Financial Capability under Paragraph (i) above if all pending litigation will be resolved against the Tenderer. Tenderer shall provide information on pending litigations in the appropriate form.
 - c) Litigation History
There shall be no consistent history of court/arbitral award decisions against the Tenderer, in the last three (3) years) (2020/2021/2022). All parties to the contract shall furnish the information in the appropriate form about any litigation or arbitration resulting from contracts completed or ongoing under its execution over the years specified. A consistent history of awards against the Tenderer or any member of a JV may result in rejection of the tender.

8. QUALIFICATION FORM
SUMMARY

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document Completed by Tenderer to Be	For Procuring Entity's Use (Qualification met or Not Met)
1	Nationality	Nationality in accordance with ITT 3.6	Forms ELI – 1.1 and 1.2, with attachments	
2	Tax Obligations for Kenyan Tenderers	Has produced a current tax clearance certificate or tax exemption certificate issued by the Kenya Revenue Authority in accordance with ITT 3.14.	As per attached forms	
3	Conflict of Interest	No conflicts of interest in accordance with ITT 3.3	As per attached forms	
4	PPRA Eligibility	Not having been declared ineligible by the PPRA as described in ITT 3.8	As per attached forms	
5	State-owned Enterprise	Meets conditions of ITT 3.7	Forms ELI – 1.1 and 1.2, with attachments	

6	Goods, equipment and services to be supplied under the contract	To have their origin in any country that is not determined ineligible under ITT 4.1	Forms ELI – 1.1 and 1.2, with attachments	
7	History of Non-Performing Contracts	Non-performance of a contract did not occur as a result of contractor default since 1 st January [.....].	Form CON-2	
8	Suspension Based on Execution of Tender/Proposal Securing Declaration	Not under suspension based on-execution of a Tender/Proposal Securing Declaration pursuant to ITT 19.9	As per attached forms	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Qualification met or Not Met)
	by the Procuring Entity			

9	Pending Litigation	Tender's financial position and prospective long-term profitability still sound according to criteria established in 3.1 and assuming that all pending litigation will NOT be resolved against the Tenderer.	Form CON – 2	
10	Litigation History	No consistent history of court/arbitral award decisions against the Tenderer since 1 st January [insert year]	Form CON – 2	
11	Financial Capabilities	(i) The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as Kenya Shillings [insert amount] equivalent for the subject contract(s) net of the Tenderer's other commitments. (ii) The Tenderers shall also demonstrate, to the satisfaction of the Procuring Entity, that it has adequate sources of finance to meet the cash flow	Form FIN – 3.1, with attachments	

1	2	3	4	5
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Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Qualification met or Not Met)
		requirements on works currently in progress and for future contract commitments. (iii) The audited balance sheets or, if not required by the laws of the Tenderer's country, other financial statements acceptable to the Procuring Entity, for the last [insert number of years] years shall be submitted and must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long-term profitability.		
12	Average Annual Construction Turnover	Minimum average annual construction turnover of Kenya Shillings [insert amount], equivalent calculated as total certified payments received for contracts in progress and/or completed within the last [insert of year] years, divided by [insert number of years] years	Form FIN – 3.2	

13	General Construction Experience	Experience under construction contracts in the role of prime contractor, JV member, subcontractor, or management contractor for at least the last [insert number of years] years, starting 1 st January [insert year].	Form EXP – 4.1	
	Specific Construction & Contract	A minimum number of [state the number] similar contracts specified below that have been	Form EXP 4.2(a)	

1	2	3	4	5
Item No.	Qualification Subject	Qualification Requirement	Document To be Completed by Tenderer	For Procuring Entity's Use (Qualification met or Not Met)

	Management Experience	satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or sub-contractor between 1st January [insert year] and tender submission deadline i.e. (number) contracts, each of minimum value Kenya shillings..... equivalent. [In case the Works are to be tender as individual contracts under multiple contract procedure, the minimum number of contracts required for purposes of evaluating qualification shall be selected from the options mentioned in ITT 35.4] The similarity of the contracts shall be based on the following: [Based on Section VII, Scope of Works, specify the minimum key requirements in terms of physical size, complexity, construction method, technology and/or other characteristics including part of the requirements that may be met by specialized subcontractors, if permitted in accordance with ITT 34.3]		
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QUALIFICATION FORMS

1. FORM EQU: EQUIPMENT

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

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Omit the following information for equipment owned by the Tenderer.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex

Agreements	Details of rental / lease / manufacture agreements specific to the project

2. FORM PER -1

Contractor's Representative and Key Personnel Schedule

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

Contractor' Representative and Key Personnel

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

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

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

3. **FORM PER-2:**

Resume and Declaration - Contractor's Representative and Key Personnel.

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

Name of Tenderer

Position [#1]: [title of position from Form PER-1]

Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: [language and levels of speaking, reading and writing skills]	
Details		
	Address of Procuring Entity:	

	Telephone:	Contact (manager / personnel officer):
	Fax:	
	Job title:	Years with present Procuring Entity:

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

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

Declaration

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

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

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

I understand that any misrepresentation or omission in this Form may: a)
be taken into consideration during Tender evaluation;
b) result in my disqualification from participating in the Tender;
c) result in my dismissal from the contract.

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

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Tenderer:

Signature: _____ Date: (day
month year): _____

4. TENDERER'S QUALIFICATION WITHOUT PRE-QUALIFICATION

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

4.1 FORM ELI -1.1

Tenderer Information Form

Date: _____

ITTNo.andtitle: _____

Tenderer's name
In case of Joint Venture (JV), name of each member:
Tenderer's actual or intended country of registration: [indicate country of Constitution]
Tenderer's actual or intended year of incorporation:
Tenderer's legal address [in country of registration]:
Tenderer's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT 3.6 ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 3.5 ☐ In case of state-owned enterprise or institution, in accordance with ITT 3.8, documents establishing: • Legal and financial autonomy • Operation under commercial law • Establishing that the Tenderer is not under the supervision of the Procuring Entity 2. Included are the organizational chart and a list of Board of Directors.

[4.2 FORM ELI -1.2](#)

Tenderer's JV Information Form (to be completed for each member of Tenderer's JV)

Date: _____

ITTNo.andtitle: _____

Tenderer's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 3.6. ☐ In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Procuring Entity, in accordance with ITT 3.8. 2. Included are the organizational chart and a list of Board of Directors.

4.3 [FORM CON – 2](#)

Historical Contract Non-Performance, Pending Litigation and Litigation History

Tenderer's Name: _____

Date: _____

JV Member's Name: _____

ITT No. and title: _____

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria

☐ Contract non-performance did not occur since 1st January [insert year] specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.

☐ Contract(s) not performed since 1st January [insert year] specified in Section III, Evaluation and Qualification Criteria, requirement 2.1

Year	Non-performed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and Kenya Shilling equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Procuring Entity: [insert full name] Address of Procuring Entity: [insert street/city/country] Reason(s) for nonperformance: [indicate main reason(s)]	[insert amount]

Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria

☐ No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.

☐ Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.

Year of dispute	Amount dispute (currency)	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
		Contract Identification: _____ Name of Procuring Entity: _____ Address of Procuring Entity: _____ Matter in dispute: _____ Party who initiated the dispute: _____ Status of dispute: _____	
		Contract Identification: Name of Procuring Entity: Address of Procuring Entity: Matter in dispute: Party who initiated the dispute: Status of dispute:	
Litigation History in accordance with Section III, Evaluation and Qualification Criteria			
☐ No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4. ☐ Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4 as indicated below.			
Year of award	Outcome as percentage of Net Worth	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)

[insert year]	[insert percentage]	Contract Identification: [indicate complete contract name, number, and any other identification] Name of Procuring Entity: [insert full name] Address of Procuring Entity: [insert street/city/country] Matter in dispute: [indicate main issues in dispute] Party who initiated the dispute: [indicate "Procuring Entity" or "Contractor"] Reason(s) for Litigation and award decision [indicate main reason(s)]	[insert amount]
---------------	---------------------	--	-----------------

4.4 FORM FIN – 3.1:

Financial Situation and Performance

Tenderer's Name: _____

Date: _____

JVMember'sName_____

ITTNo.andtitle: _____

4.4.1. Financial Data

Type of Financial information in _____	Historic information for previous _____ years, _____ (amount in currency, currency, exchange rate*, USD)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					

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

*Refer to ITT 15 for the exchange rate

4.4.2 Sources of Finance

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

No .	Source of finance	Amount (Kenya Shilling equivalent)
1		

2		
3		

4.4.3 Financial documents

The Tenderer and its parties shall provide copies of financial statements for _____years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor

3.1. The financial statements shall:

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

☐ Attached are copies of financial statements¹ for the _____years required above; and complying with the requirements

¹ If the most recent set of financial statements is for a period earlier than 12 months from the date of Tender, the reason for this should be justified.

FORM FIN – 3.2:

Average Annual Construction Turnover

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITTNo. and title: _____

		Annual turnover data (construction only)	
Year	Amount Currency	Exchange rate	Kenya equivalent Shilling
[indicate year]	[insert amount and indicate currency]		
Average Annual Construction Turnover *			

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

4.6 FORM FIN – 3.3:

Financial Resources

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

Financial Resources		
No.	Source of financing	Amount (Kenya Shilling equivalent)
1		
2		
3		

FORM FIN – 3.4:

Current Contract Commitments / Works in Progress

Tenderers and each member to a JV should provide information on their current commitments

on all contracts that have been awarded, or for which a letter of intent or acceptance has been

received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Current Contract Commitments

No.	Name of Contract	Procuring Entity's Contact Address, Tel,	Value of Outstanding Work [Current Kenya Shilling /month Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [Kenya Shilling /month)]
1					
2					
3					
4					
5					

FORM EXP - 4.1

General Construction Experience

Tenderer's Name: _____

Date: _____

JVMember'sName _____

ITTNo.andtitle: _____

Page _____ of _____ pages

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

FORM EXP - 4.2(a)

Specific Construction and Contract Management Experience

Tenderer's Name: _____

Date: _____

JVMember'sName _____

ITTNo.andtitle: _____

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member JV ☐	in Management Contractor ☐	Subcontractor ☐
Total Contract Amount	☐ Kenya Shilling			
If member in a JV or subcontractor, specify participation in total Contract amount				
Procuring Entity's Name:				
Address:				
Telephone/fax number				
E-mail:				

4.10 FORM EXP - 4.2 (a) (cont.)

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	

2. Physical size of required works items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

FORM EXP - 4.2(b)

Construction Experience in Key Activities

Tenderer's Name: _____

Date: _____

Tenderer's JV Member Name: _____

Sub-contractor's Name²(as per ITT 34): _____

ITT No. and title: _____

All Sub-contractors for key activities must complete the information in this form as per ITT 34 and Section III, Evaluation and Qualification Criteria, Sub-Factor 4.2.

1. Key Activity No One: _

	Information		
Contract Identification			
Award date			
Completion date			
Role in Contract	Prime Contractor	Member in JV	Management Subcontractor Contractor
Total Contract Amount	☐	☐	☐ Kenya Shilling ☐
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)	Actual Quantity Performed (i) x (ii)
Year 1			
Year 2			
Year 3			
Year 4			
Procuring Entity's Name:			
Address:			
Telephone/fax number			
E-mail:			

² If applicable

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

OTHER FORMS

5. FORM OF TENDER

(Amended and issued pursuant to PPRA CIRCULAR No. 02/2022)

INSTRUCTIONS TO TENDERERS

- i)* All italicized text is to help the Tenderer in preparing this form.
- ii)* The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address. Tenderers are reminded that this is a mandatory requirement.
- iii)* Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION FORMS OF THE TENDERER as listed under (s) below.
- iv)* The Form of Tender shall include the following Forms duly completed and signed by the Tenderer.

Tenderer's Eligibility- Confidential Business Questionnaire

Certificate of Independent Tender Determination

Self-Declaration of the Tenderer

Date of this Tender submission:[insert date (as day, month and year)
of Tender submission]

Tender Name and Identification:[insert identification] Alternative

No. [insert identification No if this is a Tender for an alternative]

To:
[Insert complete name of Procuring Entity]

Dear Sirs,

- 1.* In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above-named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum of Kenya Shillings [[Amount in figures]

Shillings [amount in words]_____.

The above amount includes foreign currency amount (s) of [state figure or a percentage and currency] [figures]_[words] _____ .

The percentage or amount quoted above does not include provisional sums, and only allows not more than two foreign currencies.

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Project Manager's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Special Conditions of Contract.
3. We agree to adhere 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. We further understand that you are not bound to accept the lowest or any tender you may receive.
5. We, the undersigned, further declare that:
 - i) No reservations: We have examined and have no reservations to the tender document, including Addenda issued in accordance with ITT 28;
 - ii) Eligibility: We meet the eligibility requirements and have no conflict of interest in accordance with ITT 3 and 4;
 - iii) Tender-Securing Declaration: We have not been suspended nor declared ineligible by the Procuring Entity based on execution of a Tender-Securing or Proposal-Securing Declaration in the Procuring Entity's Country in accordance with ITT 19.8;
 - iv) Conformity: We offer to execute in conformity with the tendering documents and in accordance with the implementation and completion specified in the construction schedule, the following Works: [insert a brief description of the Works];
 - v) Tender Price: The total price of our Tender, excluding any discounts offered in item 1 above is: [Insert one of the options below as appropriate]
 - vi) Option 1, in case of one lot: Total price is: [insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies]; Or

Option 2, in case of multiple lots:

- a) Total price of each lot [insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies]; and
 - b) Total price of all lots (sum of all lots) [insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies];
- vii) Discounts: The discounts offered and the methodology for their application are:
- viii) The discounts offered are: [Specify in detail each discount offered.] ix) The exact method of calculations to determine the net price after application of discounts is shown below: [Specify in detail the method that shall be used to apply the discounts];
- x) Tender Validity Period: Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- xi) Performance Security: If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering document;
- xii) One Tender Per Tender: We are not submitting any other Tender(s) as an individual Tender, and we are not participating in any other Tender(s) as a Joint Venture member or as a subcontractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;
- xiii) Suspension and Debarment: We, along with any of our subcontractors, suppliers, Project Manager, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Public Procurement Regulatory Authority or any other entity of the Government of Kenya, or any international organization. xiv) State-owned enterprise or institution: [select the appropriate option and delete the other] [We are not a state-owned enterprise or institution] / [We are a state-owned enterprise or institution but meet the requirements of ITT 3.8];
- xv) Commissions, gratuities, fees: We have paid, or will pay the following commissions, gratuities, or fees with respect to the tender process or execution of the Contract: [insert complete name of each Recipient, its full address, the reason for which

each commission or gratuity was paid and the amount and currency of each such commission or gratuity].

Name of Recipient	Address	Reason	Amount

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

- xvi) Binding Contract: We understand that this Tender, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- xvii) Not Bound to Accept: We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive;
- xviii) Fraud and Corruption: We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption;
- xix) Collusive practices: We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the "Certificate of Independent Tender Determination" attached below.
- xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from___(specify website) during the procurement process and the execution of any resulting contract.
- xxi) **Beneficial Ownership Information**: We commit to provide to the procuring entity the Beneficial Ownership Information in conformity with the Beneficial Ownership Disclosure Form upon receipt of notification of intention to enter into a contract in the event we are the successful tenderer in this subject procurement proceeding.

xxii) We, the Tenderer, have duly completed, signed and stamped the following Forms as part of our Tender:

- a) Tenderer's Eligibility; Confidential Business Questionnaire – to establish we are not in any conflict to interest.
- b) Certificate of Independent Tender Determination – to declare that we completed the tender without colluding with other tenderers.
- c) Self-Declaration of the Tenderer – to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.
- d) Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal

Further, we confirm that we have read and understood the full content and scope of fraud and corruption as informed in "**Appendix 1- Fraud and Corruption**" attached to the Form of Tender.

Name of the Tenderer: *[insert complete name of person signing the Tender]

Name of the person duly authorized to sign the Tender on behalf of the Tenderer: **[insert complete name of person duly authorized to sign the Tender]

Title of the person signing the Tender: [insert complete title of the person signing the Tender]

Signature of the person named above: [insert signature of person whose name and capacity are shown above] **Date signed**
[insert date of signing] day of [insert month], [insert year]

Date signed _____ day of _____, ____

Notes

* In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer

** Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.

A. TENDERER'S ELIGIBILITY- CONFIDENTIAL BUSINESS QUESTIONNAIRE

Instruction to Tenderer

Tender is instructed to complete the particulars required in this Form, one form for each entity if Tender is a JV. Tenderer is further reminded that it is an offence to give false information on this Form.

(a) Tenderer's details

	ITEM	DESCRIPTION
1	Name of the Procuring Entity	
2	Reference Number of the Tender	
3	Date and Time of Tender Opening	
4	Name of the Tenderer	
5	Full Address and Contact Details of the Tenderer.	1. Country 2. City 3. Location 4. Building 5. Floor 6. Postal Address 7. Name and email of contact person.
6	Current Trade License Registration Number and Expiring date	
7	Name, country and full address (postal and physical addresses, email, and telephone number) of Registering Body/Agency	
8	Description of Nature of Business	
9	Maximum value of business which the Tenderer handles.	
10	State if Tenders Company is listed in stock exchange, give name and full address (postal and physical addresses, email, and telephone number) of state which stock exchange	

General and Specific Details

b) **Sole Proprietor**, provide the following details.

Name in full _____

Age _____

Nationality _____

Country of Origin _____

Citizenship _____

c) **Partnership**, provide the following details.

	Names of Partners	Nationality	Citizenship	% owned	Shares
1					
2					
3					

d) **Registered Company**, provide the following details.

i) Private or public Company

ii) State the nominal and issued capital of the Company

Nominal Kenya Shillings
(Equivalent)..... Issued Kenya

Shillings
(Equivalent).....

iii) Give details of Directors as follows.

	Names of Director	Nationality	Citizenship	% Shares owned
1				
2				
3				

(e) **DISCLOSURE OF INTEREST**- Interest of the Firm in the Procuring Entity.

i) Are there any person/persons in (Name of Procuring Entity) who has/have an interest or relationship in this firm? Yes/No.....

If yes, provide details as follows.

	Names of Person	Designation in the Procuring Entity	Interest or Relationship with Tenderer
1			
2			
3			

ii) Conflict of interest disclosure

	Type of Conflict	Disclosure YES NO	OR	If YES details of relationship with the Tenderer
1	Tenderer is directly or indirectly controlling, is controlled by or is under common control with another tenderer.			
2	Tenderer receives or has received any direct or indirect subsidy from another tenderer.			
3	Tenderer has the same legal representative as another tenderer			
4	Tender has a relationship with another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process.			
5	Any of the Tenderer's affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the tender.			

6	Tenderer would be providing goods, works, nonconsulting services or consulting services during implementation of the contract specified in this Tender Document.		
7	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who are directly or indirectly involved in the preparation of the Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract.		
8	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who		
	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
	would be involved in the implementation or supervision of the such Contract.		
9	Has the conflict stemming from such relationship stated in item 7 and 8 above been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.		

f) Certification

On behalf of the Tenderer, I certify that the information given above is complete, current and accurate as at the date of submission.

Full Name_____ Title or Designation_____

(Signature)

(Date)

B. CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Letter of Tender to the _____

[Name of Procuring Entity] for: [Name and number of tenders] in response to the request.

Tenders made by: [Name of tender] do hereby make the following statement that I certify to be true and complete in every aspect:

I certify, on behalf of _____ ~~[Name of Tenderer]~~ that:

1. I have read and I understand the contents of this Certificate;
2. I understand that the Tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am the authorized representative of the Tenderer with authority to sign this Certificate, and to submit the Tender on behalf of the Tenderer;

4. For the purposes of this Certificate and the Tender, I understand that the word "competitor" shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) has been requested to submit a Tender in response to this request for tenders;
 - b) could potentially submit a tender in response to this request for tenders, based on their qualifications, abilities or experience;
5. The Tenderer discloses that [check one of the following, as applicable:
 - a) The Tenderer has arrived at the Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor;
 - b) the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this request for tenders, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements;
6. In particular, without limiting the generality of paragraphs (5)(a) or (5)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) methods, factors or formulas used to calculate prices;
 - c) the intention or decision to submit, or not to submit, a tender; or
 - d) the submission of a tender which does not meet the specifications of the request for Tenders; except as specifically disclosed pursuant to paragraph (5)(b) above;
7. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the works or services to which this request for tenders relates, except as specifically authorized by the procuring authority or as specifically disclosed pursuant to paragraph (5)(b) above;
8. the terms of the Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (5)(b) above.

Name _____ Title _____ Date _____

[Name, title and signature of authorized agent of Tenderer and Date].

C. SELF - DECLARATION FORMS

FORM SD1

SELF DECLARATION THAT THE PERSON/TENDERER IS NOT DEBARRED IN THE MATTER OF THE PUBLIC PROCUREMENT AND ASSET DISPOSAL ACT 2015.

I,, of Post Office Box being a resident of in the Republic of do hereby make a statement as follows: -

1. THAT I am the Company Secretary/ Chief Executive/Managing Director/Principal Officer/Director of (insert name of the Company) who is a Bidder in respect of Tender No. for (insert tender title/description) for (insert name of the Procuring entity) and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its Directors and subcontractors have not been debarred from participating in procurement proceeding under Part IV of the Act.
3. THAT what is deponed to herein above is true to the best of my knowledge, information and belief.

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

Bidder Official Stamp

FORM SD2

SELF DECLARATION THAT THE PERSON/TENDERER WILL NOT ENGAGE IN ANY CORRUPT OR FRAUDULENT PRACTICE

I, of P. O. Box being a resident of in the Republic of do hereby make a statement as follows:

-

1. THAT I am the Chief Executive/Managing Director/Principal Officer/Director of (insert name of the Company) who is a Bidder in respect of Tender No. for (insert tender title/description) for (insert name of the Procuring entity) and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its servants and/or agents /subcontractors will not engage in any corrupt or fraudulent practice and has not been requested to pay any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (insert name of the Procuring entity) which is the procuring entity.

3. THAT the aforesaid Bidder, its servants and/or agents /subcontractors have not offered any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (name of the procuring entity)
4. THAT the aforesaid Bidder will not engage /has not engaged in any corrosive practice with other bidders participating in the subject tender
5. THAT what is deponed to herein above is true to the best of my knowledge information and belief.

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

Bidder's Official Stamp

DECLARATION AND COMMITMENT TO THE CODE OF ETHICS

I (person) on behalf of (Name of the Business/
 Company/Firm) declare that I have read and fully understood the contents of the Public Procurement & Asset Disposal Act, 2015, Regulations and the Code of Ethics for persons participating in Public Procurement and Asset Disposal and my responsibilities under the Code.

I do hereby commit to abide by the provisions of the Code of Ethics for persons participating in Public Procurement and Asset Disposal.

Name of Authorized signatory.....
 Sign.....

Position.....

Office address.....

Telephone.....

Email.....

.....

.....

Name of the
 Firm/Company.....

.....

...

Date..... (Company

Seal/ Rubber Stamp where applicable)

Witness

Name

Sign.....

Date.....

D. APPENDIX 1- FRAUD AND CORRUPTION

(Appendix 1 shall not be modified)

1. Purpose

- 2.** The Government of Kenya's Anti-Corruption and Economic Crime laws and their sanction's policies and procedures, Public Procurement and Asset Disposal Act (no. 33 of 2015) and its Regulation, and any other Kenya's Acts or Regulations related to Fraud and Corruption, and similar offences, shall apply with respect to Public Procurement Processes and Contracts that are governed by the laws of Kenya.

3. Requirements

The Government of Kenya requires that all parties including Procuring Entities, Tenderers, (applicants/proposers), Consultants, Contractors and Suppliers; any Subcontractors, Sub-consultants, Service providers or Suppliers; any Agents (whether declared or not); and any of their Personnel, involved and engaged in procurement under Kenya's Laws and Regulation, observe the highest standard of ethics during the procurement process, selection and contract execution of all contracts, and refrain from Fraud and Corruption and fully comply with Kenya's laws and Regulations as per paragraphs 1.1 above.

Kenya's public procurement and asset disposal act (no. 33 of 2015) under Section 66 describes rules to be followed and actions to be taken in dealing with Corrupt, Coercive, Obstructive, Collusive or Fraudulent practices, and Conflicts of Interest in procurement including consequences for offences committed. A few of the provisions noted below highlight Kenya's policy of no tolerance for such practices and behavior:

-

- 1) a person to whom this Act applies shall not be involved in any corrupt, coercive, obstructive, collusive or fraudulent practice; or conflicts of interest in any procurement or asset disposal proceeding;
- 2) A person referred to under subsection (1) who contravenes the provisions of that subsection commits an offence;

- 3) Without limiting the generality of the subsection (1) and (2), the person shall be:
 -
 - a) disqualified from entering into a contract for a procurement or asset disposal proceeding; or
 - b) if a contract has already been entered into with the person, the contract shall be voidable;
4. The voiding of a contract by the procuring entity under subsection (7) does not limit any legal remedy the procuring entity may have;
5. An employee or agent of the procuring entity or a member of the Board or committee of the procuring entity who has a conflict of interest with respect to a procurement:
 - a) shall not take part in the procurement proceedings;
 - b) shall not, after a procurement contract has been entered into, take part in any decision relating to the procurement or contract; and
 - c) shall not be a subcontractor for the bidder to whom was awarded contract, or a member of the group of bidders to whom the contract was awarded, but the subcontractor appointed shall meet all the requirements of this Act.
6. An employee, agent or member described in subsection (1) who refrains from doing anything prohibited under that subsection, but for that subsection, would have been within his or her duties shall disclose the conflict of interest to the procuring entity;
7. If a person contravenes subsection (1) with respect to a conflict of interest described in subsection (5)(a) and the contract is awarded to the person or his relative or to another person in whom one of them had a direct or indirect pecuniary interest, the contract shall be terminated and all costs incurred by the public entity shall be made good by the awarding officer. Etc.

In compliance with Kenya's laws, regulations and policies mentioned above, the Procuring Entity:

- a) Defines broadly, for the purposes of the above provisions, the terms set forth below as follows:
 - i) "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - ii) "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
 - iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
 - iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - v) "obstructive practice" is:

- deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede investigation by Public Procurement Regulatory Authority (PPRA) or any other appropriate authority appointed by Government of Kenya into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - acts intended to materially impede the exercise of the PPRA's or the appointed authority's inspection and audit rights provided for under paragraph 2.3 e. below.
- b) Defines more specifically, in accordance with the above procurement Act provisions set forth for fraudulent and collusive practices as follows:
- "fraudulent practice" includes a misrepresentation of fact in order to influence a procurement or disposal process or the exercise of a contract to the detriment of the procuring entity or the tenderer or the contractor, and includes collusive practices amongst tenderers prior to or after tender submission designed to establish tender prices at artificial non-competitive levels and to deprive the procuring entity of the benefits of free and open competition.
- c) Rejects a proposal for award¹ of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, subcontractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
- d) Pursuant to the Kenya's above stated Acts and Regulations, may sanction or recommend to appropriate authority (ies) for sanctioning and debarment of a firm or individual, as applicable under the Acts and Regulations;
- e) Requires that a clause be included in Tender documents and Request for Proposal documents requiring (i) Tenderers (applicants/proposers), Consultants, Contractors, and Suppliers, and their Sub-contractors, Sub-consultants, Service providers, Suppliers, Agents personnel, permit the PPRA or any other appropriate authority appointed by

Government of Kenya to inspect³ all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and

³ Inspections in this context usually are investigative (i.e., forensic) in nature. They involve factfinding activities undertaken by the Investigating Authority or persons appointed by the Procuring Entity to address specific matters related to investigations/audits, such as

to have them audited by auditors appointed by the PPRA or any other appropriate authority appointed by Government of Kenya; and

- f) Pursuant to Section 62 of the above Act, requires Applicants/Tenderers to submit along with their Applications/Tenders/Proposals a "Self-Declaration Form" as included in the procurement document declaring that they and all parties involved in the procurement process and contract execution have not engaged/will not engage in any corrupt or fraudulent practices.

¹For the avoidance of doubt, a party's ineligibility to be awarded a contract shall include, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and tendering, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

FORM OF TENDER SECURITY- [Option 1–Demand Bank Guarantee]

Beneficiary: _____

Request _____ for Tenders _____ No: _____

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that (here in after called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here in after called "the Tender") for the execution of _____ under Request for Tenders No. ("the ITT").
2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.
3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of ____ () upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:
 - (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or
 - b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension there to provide by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance.
4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) thirty days after the end of the Tender Validity Period.
5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee]

TENDER GUARANTEE No.: _____

1. Whereas [Name of the tenderer] (hereinafter called “the tenderer”) has submitted its tender dated [Date of submission of tender] for the [Name and/or description of the tender] (hereinafter called “the Tender”) for the execution of __under Request
for
Tenders No. _____ (“the ITT”).
2. KNOW ALL PEOPLE by these presents that WE of [**Name of Insurance Company**] having our registered office at (hereinafter called “the Guarantor”), are bound unto [Name of Procuring Entity] (hereinafter called “the Procuring Entity”) in the sum of (Currency and guarantee amount) for which payment well and truly to be made to the said Procuring Entity, the Guarantor binds itself, its successors and assigns, jointly and severally, firmly by these presents.
Sealed with the Common Seal of the said Guarantor this ____day of _____ 20 ____.
3. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Applicant:
- a) has withdrawn its Tender during the period of Tender validity set forth in the Principal’s Letter of Tender (“the Tender Validity Period”), or any extension thereto provided by the Principal; or
 - b) having been notified of the acceptance of its Tender by the Procuring Entity during the Tender Validity Period or any extension thereto provided by the Principal; (i) failed to execute the Contract agreement; or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to tenderers (“ITT”) of the Procuring Entity’s Tendering document.

then the guarantee undertakes to immediately pay to the Procuring Entity up to the above amount upon receipt of the Procuring Entity's first written demand, without the Procuring Entity having to substantiate its demand, provided that in its demand the Procuring Entity shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

- 4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) twenty-eight days after the end of the Tender Validity Period.
- 5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

_____ [Date]	_____ [Signature of the Guarantor]
_____ [Witness]	_____ [Seal]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

TENDER-SECURING DECLARATION FORM

[The Bidder shall complete this Form in accordance with the instructions indicated]

Date:[insert date (as day, month and year) of Tender Submission]

Tender No.:[insert number of tendering process]

To: [insert complete name of Purchaser] I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Tender Securing Declaration.
2. I/We accept that I/we will automatically be suspended from being eligible for tendering in any contract with the Purchaser for the period of time of [insert number of months or years] starting on [insert date], if we are in breach of our obligation(s) under the bid conditions, because we – (a) have withdrawn our tender during the period of tender validity specified by us in the Tendering Data Sheet; or (b) having been notified of the acceptance of our Bid by the Purchaser during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the instructions to tenders.
3. I/We understand that this Tender Securing Declaration shall expire if we are not the successful Tenderer(s), upon the earlier of:
 - a) our receipt of a copy of your notification of the name of the successful Tenderer; or
 - b) thirty days after the expiration of our Tender.
4. I/We understand that if I am/we are/in a Joint Venture, the Tender Securing Declaration must be in the name of the Joint Venture that submits the bid, and the Joint Venture has not been legally constituted at the time of bidding, the Tender Securing Declaration shall be in the names of all future partners as named in the letter of intent.

Signed..... Capacity / title

(director or partner or sole proprietor, etc.) Name:

..... Duly authorized to sign

the bid for

and on behalf of: [insert complete name of Tenderer]

Dated on day of [Insert date of signing] Seal or stamp

Appendix to Tender

Schedule of Currency requirements

Summary of currencies of the Tender for _____ [insert name of Section of the Works]

Name of currency	Amounts payable
Local currency: _____	
Foreign currency #1: _____	
Foreign currency #2: _____	
Foreign currency #3: _____	
Provisional sums expressed in local currency _____ —	[To be entered by the Procuring Entity]

PART II - WORK REQUIREMENTS

SECTION V - DRAWINGS

A list of drawings should be inserted here. The actual drawings including Site plans should be annexed in a separate booklet.

SECTION VI - SPECIFICATIONS

Notes for preparing Specifications

1. Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the Procuring Entity and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be permanently incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.
2. Specifications from previous similar projects are useful and may not be necessary to re-write specifications for every Works Contract.
3. There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as highways, urban housing, irrigation and water supply. The General Specifications should cover all classes of workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.
4. Care must be taken in drafting Specifications to ensure they are not restrictive. In the Specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards may also be used.
5. The Procuring Entity should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.
6. The Procuring Entity should provide a description of the selected parts of the Works with appropriate reference to Drawings, Specifications, Bills of Quantities, and Design or Performance criteria, stating that the alternative solutions shall be at least structurally and functionally equivalent to the basic design parameters and Specifications.

1. Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details. Technical alternatives permitted in this manner shall be considered by the Procuring Entity each on its own merits and independently of whether the tenderer has priced the item as described in the Procuring Entity's design included with the tender documents.

SECTION VII- BILLS OF QUANTITIES

1. Objectives

The objectives of the Bill of Quantities are:

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

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

2. Day work Schedule

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

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

3. Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary priced Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Special Conditions of

Contract should state the manner in which they shall be used, and under whose authority (usually the Project Manager's).

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description. A separate procurement procedure is normally carried out by the Procuring Entity to select such specialized contractors. To provide an element of competition among the Tenderers in respect of any facilities, amenities, attendance, etc., to be provided by the successful Tenderer as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Tenderer to quote a sum for such amenities, facilities, attendance, etc.

the Procuring Entity or the person drafting the tendering document. They should not be included in the final tendering document.

4. The Bills of Quantities

The Bills of Quantities should be divided generally into the following sections: a) Preambles

- b) Preliminary items
- c) Work Items
- c) Daywork Schedule; and
- d) Provisional items
- e) Summary.

Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
A	General Provisions
1.	Scope of Tender
ITT 1.1	The name of the contract is CONSTRUCTION OF MBUGITI IRRIGATION PROJECT, GATANGA SUB-COUNTY – MURANGA COUNTY-
	The reference number of the contract is MWSI/ONT/SDI/020/2023-2024

	The scope of works is as follows The work Involves but is not limited to the following minimum conditions. • Preliminaries and General • Intake Works • Sedimentation Tank • River & Gully Crossings • Conveyance Pipeline • Main lines • Sub-Mains • In-Field System

SECTION VI - SPECIFICATIONS

Notes for preparing Specifications

7. Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the Procuring Entity and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be permanently incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.
8. Specifications from previous similar projects are useful and may not be necessary to re-write specifications for every Works Contract.
9. There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as highways, urban housing, irrigation and water supply. The General Specifications should cover all classes of

workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.

10. Care must be taken in drafting Specifications to ensure they are not restrictive. In the Specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards may also be used.
11. The Procuring Entity should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.
12. The Procuring Entity should provide a description of the selected parts of the Works with appropriate reference to Drawings, Specifications, Bills of Quantities, and Design or Performance criteria, stating that the alternative solutions shall be at least structurally and functionally equivalent to the basic design parameters and Specifications.
13. Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details. Technical alternatives permitted in this manner shall be considered by the Procuring Entity each on its own merits and independently of whether the tenderer has priced the item as described in the Procuring Entity's design included with the tender documents.

SECTION IV: TECHNICAL SPECIFICATIONS

GENERAL

1. General Description of the Works

Works to be undertaken by the Contractor

The main works to be undertaken under this contract comprise the following:

Construction of Mbugiti Irrigation Project, Gatanga sub-county – Muranga County:

1. Preliminaries and General
2. Intake Works
3. Sedimentation Tank
4. River & Gully Crossings
5. Conveyance Pipeline
6. Main lines
7. Sub-Mains
8. In-Field System

2. Location of the Works

The project is located about Gatanga Subcounty, Muranga County.

3. Climatic Conditions

Located at an elevation of none meters (0 feet) above sea level, Gatanga has a Tropical wet and dry or savanna climate (Classification: Aw). The district's yearly temperature is 22.07°C (71.73°F) and it is -0.43% lower than Kenya's averages. Gatanga typically receives about 128.22 millimeters (5.05 inches) of precipitation and has 209.82 rainy days (57.48% of the time) annually.

4. Drawings and Documents

The drawings listed in Section 6 of the Tender Documents and any other modifications to those drawings and any other drawings that may be prepared by the Contractor and approved by the Engineer shall subsequently become the Contract Drawings.

For the purpose of carrying out the Contract, the Contractor will be provided with 2 sets off the Contract Documents and full size (A1) Contract Drawings.

Standard Specifications

For convenience and in order to establish the necessary standards of quality, reference has been made to specifications issued by national or other widely recognized bodies. Such specifications shall be referred to as 'Standard Specifications' and shall be the latest editions of such specifications issued prior to the issue of these Tender documents together with such additions or amendments as may have been issued prior to the same date.

Subject to the written approval of the Engineer, any other internationally accepted Standard

Specification which requires an equal quality of work may be used.

If the Contract or proposes to use a Standard Specification other than that specified, three copies of the proposed Standard Specification in English, shall be submitted to the Engineer not less approval of Standard Specification is required. In referring to Standard Specifications, the following abbreviations are

used: BS	British Standard
ISO	International Organization for Standardization
ASTM	American Society for Testing and Materials
ASA	American Standards Association
KBS	Kenya Bureau of Standards
KS	Kenya standard

Works Designed by the Contractor

All drawings, calculations, plans, reports, instruction manuals, pamphlets, data and all other documents required to be submitted by the Contractor under the Contract shall be clear and readable. The Contractor shall submit these drawings and documents in a logical order to the Engineer for review or approve at least fifty-six (56) calendar days prior to execution of the Works.

All shop drawings, including field erection, layout and construction details shall be furnished by the Contractor for the approval of the Engineer.

All the drawings and calculation to substantiate the design shall be checked signed and approved by the Contractor prior to submission. The drawings shall also be signed by a qualified engineer responsible for the design.

Approval of the drawings by the Engineer shall not be construed as a complete check but will indicate only that the general method and detailing is satisfactory. The approval by the Engineer shall not relieve the Contractor of the requirement of the Contract or responsibility for correct installation and assembly of parts in final position or responsibility.

All the cost thereof will be deemed to be included in the Contractor's unit rates and Contract sum.

a. As Built Drawings

Within forty-five (45) days after the receipt of the Completion Certificate, the Contractor shall submit to the Engineer all the approved drawings and documents (including operation and maintenance manuals), clearly revised and brought up to date by the Contractor to show the permanent construction actually made. The submission shall be made in the following manner and quantity:

- One (1) set of the A1 size reproducible drawings on high quality polyester transparent film or similar material,
- One (1) set of the A1 size blueprint.
- The submission shall contain the drawing index.
- No separate payments will be made for the provision of the drawings as the cost thereof shall be deemed to be included in the unit rates and the Contract Sum.

b. Site Meetings

The Contractor shall be obliged to attend all meetings at the appointed time. The discussions of such meetings shall include but not be limited to the progress of work and problems having direct bearing on the immediate and long-term activities (construction, procurement, transport, labor etc.). The Engineer shall invite the Employer for such meetings.

c. Progress Photographs

The Contractor shall furnish the Engineer with colored photographs (not less than 8cmx12cm size) of the working progress throughout the Contract period. The photographs shall be taken at the start, during and at the completion of each major task of the work as directed by the Engineer. Brief description and date of each photograph shall be included.

All negatives shall be numbered, retained on the site and on completion of the Works the negatives shall become the property of the Employer.

d. Level Datum

The survey control points and benchmarks shown on the drawings shall be handed over to the Contractor as basis for surveying and setting out of Works. The Contractor shall be responsible for carrying out the field surveys for the performance of the Works.

Before using the control points and benchmarks for setting out of the Works, the Contractor shall carry out a check survey there on and satisfy himself as to their accuracy. The Employer shall bear no responsibility for the accuracy of any control point or benchmark.

The Contractor may establish additional temporary bench marks for his own convenience but each temporary bench mark shall be of a design and in a location approved by the Engineer and shall be accurate in relation to the benchmarks established by the Engineer.

The Contractor shall protect the reference points and level bench marks and in the event of any damage he shall re-survey and re-establish the points and benchmarks.

e. Setting Out

The Contractor shall appoint and employ the necessary qualified and experienced staff to set out the Works accurately. The Contractor shall establish and locate all lines and levels and be responsible for the correct location of all Works.

Where directed by the Engineer, the Contractor shall. These shall be agreed between the Contractor and the Engineer in writing before any of the surface is disturbed or covered up.

f. Construction and Checking of Work

The Contractor shall be solely responsible for and shall provide all labor, tools, lifting tackle and other equipment required for the construction and checking of the Works.

No operatives shall be allowed to execute any type of work, which is normally carried out by a skilled tradesman, unless the operative is thoroughly experienced and proficient in the trade concerned. Supervisors and operatives may be required to demonstrate their proficiency or produce certificate of competence to the satisfaction of the Engineer.

As each part of the work is carried out it shall be subject to the approval by the Engineer.

g. Supervision and Labour

The Contractor will be required to maintain a competent supervision i.e. Agent and staff on site throughout the construction period until completion of the Works, and thereafter as maybe required during the defect's liability period. The Engineer shall give prior approval to the appointment of this supervising Site Agent and key staff and shall have authority to withdraw the approval at any time in accordance with the Conditions of Contract.

All staff and labor employed on the Works shall be employed in accordance with the local labor and employment laws and regulations.

h. Works Executed by the Employer or by other Contractors

The Employer reserves the right to execute, on the site, works not included under this Contract and to employ for this purpose either his own employees or other contractors whose contracts maybe either a sub-contract under this Contractor an entirely separate contract. The Contractor shall ensure that neither his own operations nor trespass by his employees shall interfere with the operations of the Employer, or his contractors employed on such works and the same obligations shall be imposed on the Employer or other contractors in respect of work being executed under this Contract.

i. Contractor's Site Offices, Workshops, Storage and Working Areas

The Employer shall provide, free of charge, areas of land where the Contractor shall establish the office, housing, workshop, stores, accommodation and camp for himself and his employees. In which case, the Contractor shall provide erect, service and maintain all necessary buildings as offices, housing or workshop/stores for himself, his staff and his employees. These buildings shall form the time of their erection until the completion of the Contract be the property of the Employer and the Contractor shall not demolish or remove any buildings or part of any buildings without the written permission of the Engineer.

All huts, buildings, fixtures and fittings provided by the Contractor shall be removed and the site reinstated at the end of the Contract.

The Employer reserves the right to allocate areas of land less than the Contractor may require. In such case, the Contractor shall make his own arrangement for obtaining the use of the additional areas that requires.

The location of all the offices, stores and the like shall be to the approval of the Engineer.

j. Definition and Use of the Site

i. Definition of the Site

The Site shall include all those areas of land which, being public or private:

1. Are being provided by the Employer for the purpose of constructing the permanent works.
2. Are being provided by the Employer for Temporary Works, including camps, offices and stores.
3. Are acquired, leased or operated by the Contractor as borrow pits or spoil tip for the Permanent Works, including all access roads.

ii. Use of the Site

The lands and other places outside the Site which are the property of or under the control of the Employer shall not be used except with the approval of the Engineer.

The Contractor shall at any time remove any vehicle or vessel or any other obstruction under his control that may be required to be removed by the Engineer for any purpose. The Contractor shall move such obstruction promptly on instruction being given.

The Contractor shall maintain access for the inspection, operation and maintenance of any of the Employer's plan to works which lies within the Site or elsewhere.

The Contractor shall not use any portion of the Site for any purpose not connected with the Works unless the written permission of the Engineer has been obtained.

Except with the written permission of the Employer, to be given when necessary for the execution of the Works, the Contractor's employees will not be permitted to enter any of the Employer's buildings or lands, or sites under the control of other contractors or the Engineer. The Contractor shall warn his employees that any person found within such buildings or sites without authority is liable to be removed from the Works in accordance with the Conditions of Contract.

k. Possession of the Site

The Contractor shall restrict to those areas of the Site adjacent to the works being executed and shall avoid any encroachment upon lands outside the areas for which possession has been given. Any trespass or damage or any claim arising from such encroachment shall be the Contractor's sole responsibility and he shall hold the Employer indemnified against all claims arising from such trespass or damage.

l. Interference with the Works

The Contractor shall not interfere in anyway with any existing works, whether the property of the Employer or of a third party, whether or not the position of such works is indicated to the Contractor by the Engineer, except where such interference is specifically described as part of the Works, either in the Contractor in an instruction from the Engineer.

m. Material for the Works

All material shall comply with appropriate Standard Specifications unless otherwise required herein after.

The Contractor shall, before placing any order of materials, manufactured articles or machinery for incorporation in the Works, submit for the approval of the Engineer the names of the suppliers from whom he proposes to obtain such materials, manufactured articles or machinery, together with a list of the same, giving the origin, quality, weight, strength, description and other relevant details. No materials, manufactured articles or machinery shall be ordered or obtained from any suppliers which the Engineer has not approved in writing.

All materials shall be delivered to the Site a sufficient period of time before they are required for use in the Works, to enable the Engineer to take such samples as he may wish for testing and approval.

Notwithstanding the fact that approval has been given to the source of supply, the Engineer may forbid the use of any materials if, upon delivery, they are found to be defective, or he considers them unsuitable for incorporation in the Works. Such rejected materials shall be removed from the site forth with.

The Contractor may propose alternative materials of equivalent quality to those specified, and subject to the approval, such materials may be used in the Works.

The Contractor shall have no claim against the Employer in respect of any financial loss which he may suffer as a result of the rejection of any such materials, and he shall also bear the cost of removing them from the Site.

The Engineer shall have the right to inspect materials and plant for the permanent works during the course of manufacture. The Contractor shall arrange for the right of access to manufacturing premises for the Engineer and his staff during normal working

hours. The Engineer shall be given sufficient notice by the Contractor or to allow him to observe the testing of any materials for the works at the place of manufacture. The Engineer shall also be given the opportunity to inspect any material or plant in their completed state prior to packing for transport to the site.

If requested by the Engineer, the Contractor shall provide to the Engineer copies of orders for the supply of goods or materials required in connection with the works.

n. Rejected Materials and Defective Work

Materials or work which, in the opinion of the Engineer, do not comply with the Specification, shall be classified as rejected materials or defective work, and shall be cut out and removed from the Works and replaced as directed by the Engineer.

o. Existing Works and Services

The Contractor shall acquaint himself with the positions of all existing works and services including water mains, storm water drains, cables, and service poles before any excavation is commenced.

The Contractor will be held responsible for any damage, however caused, in the course of the execution of the Works, to such existing works and services.

Such existing works and services, where exposed by the execution of the works, shall be properly shored, hung-up and supported to the satisfaction of the Engineer and of the authority concerned.

Poles supporting cables and the like adjacent to the Works shall be kept securely in place until the Works are completed and shall then be made as safe and permanent as before.

Notwithstanding the foregoing requirements and without lessening the Contractor's responsibility, the Contractor shall inform the Engineer immediately any existing works have been exposed and shall comply with any requirements of the authority concerned.

Only when and as directed by the Engineer shall the position of existing works or services be changed by the Contractor to meet the requirements of the proposed work.

The Contractor shall make adequate provision so that when carrying out his work, no interference, damage or pollution is caused to roads and footpaths, or to any mains, drains, and the like or other parts of the Works. Wherever loads have to be carried over ground in which pipes, valves, culverts, and the like are buried, the Contractor shall take all precautions including where necessary, the provision and use of sleeper roads, light gauge railways or other means to prevent damage occurring to such underground works. The Contractor shall not store any plant or materials or spoil heaps over existing water mains, or in such positions that interference with access to the mains, control gates and the likes is created. Approval by the Engineer to the means of protection employed shall not relieve the Contractor of any responsibility in respect of damage occasioned by his operations.

The laying of pipework, ducts, drains, and the like shall be arranged so as to cause as little interference as possible with the smooth operation of existing works.

When breaking out and making good existing structures, the Contractor shall disturb the existing structures as little as possible. All structures shall be made good with materials similar to those used in the existing works, or such materials which are

considered by the Engineer to be of similar appearance and suitable in all other respects.

p. Existing Access

Existing access to lands, property and all other places shall be maintained by the Contractor or during the continuance of the project to the Engineer's satisfaction.

q. Liaison with Police and other Officials

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

q. Water and Power for Use on the Works

The Contractor shall be solely responsible for the location, procurement and maintenance of a water supply adequate in quality and quantity to meet his obligations under the Contract.

The Contractor shall be solely responsible for the location and continuity of the supply of water for use on the Works. Supplies may be derived from rivers and streams, but shall in all cases be to the Engineer's approval, and the abstraction of water from any sources shall not interfere with any permanent water supply. The Contractor shall be solely responsible for the transporting of water from its source to the point at which it is required for construction purposes, and in such quantities and quality as to enable the Works to proceed without hindrance due to the shortage of adequate water supplies.

The Contractor shall make his own arrangements for power supplies and shall be solely responsible for the location, procurement and maintenance of a power supply, adequate to meet this obligation under the Contract.

The Contractor shall make his own arrangements for the supply of adequate safe drinking water, electricity and other services to the Permanent Works, Temporary Works and Contractor's equipment and shall provide and maintain all pipes, cables and fittings which may be necessary to carry such services to his operations

r. Inspection by Engineer during the Defects Liability Period

The Engineer will give the Contractor due notice of his intention to carry out any inspection during the defect's liability period. The Contractor shall, upon receipt to such notice, arrange for responsible representatives to be present at the times and dates named by the Engineer. This representative shall render all necessary assistance and shall take note of all (matters and things to which his attention is directed by the Engineer.

1.1 Site Offices for the Engineer

The Contractor will construct and equip the site office as specified by the Engineer. See attached drawing.

1.2 Accommodation for the Engineer

The Engineer and his staff will arrange for their accommodation.

1.3 Survey Instruments and Chainmen for the Engineer

The Contractor shall provide and maintain in first class working order, for the sole use of the Engineer and his staff for the duration of the Contract, the following minimum survey instruments complete with all accessories, tapes, poles, staves, staging, molds, templates, profiles, and requisites necessary for checking and setting out, and measurement of the Works. The equipment shall revert to the Contractor at the end of the Contract period.

The survey equipment shall include the following or similar approved as a minimum:

Table1-1: Survey Equipment

Description	Quantity
Automatic level machine	1
Tripod stand	1
Levelling staff	2
GTS225TOPCONTotalstation	1
Single Prism and target	3
Plumbing Pole tripod with	3
50m measuring tape	1

1.4 Engineer's Laboratory

There will be no site laboratory. All samples will be taken to recognized laboratories approved by the Engineer. The Contractor shall allow for all the necessary labor and equipment necessary for the sampling.

1.5 Transport for the Engineer

The Contractor will provide engineers' transport as per the Bill of quantities

1.6 Sign Boards

Before the erection of any sign boards or posters by the Contractor, the Contractor shall obtain the approval of the Employer and the Engineer to the size, location and wording of such signboards or posters.

Unless otherwise agreed, the signboard shall be in seven sections. Section one shall contain:

a) Name of financing governments

- In white lettering on a blue background.
- The second section shall bear the words:

b) Names of the Program and Project

- In white lettering on a blue background.
- The Third section shall bear the words:

c) Name of the financiers

- In white lettering on a blue background.
- The Fourth section shall bear the words:

d) Name of the Employer

- In white lettering on a blue background.
- The fifth section shall bear the words:

e) Name of the implementing agency

- In blue lettering on a white background.
- The sixth section shall bear the words:

f) Name of the executing agency

- In blue lettering on a white background
- The Seventh section (Contractors' Board) shall bear the words: -

g) Name of the Contractor

- In blue lettering on a white background.
- Lettering on these boards shall be as directed by the Engineer.
- Further boards maybe added with the names of sub-contractors.

1.7 Tracked Contractor's Equipment

The Contractor's tracked equipment may not be run on any public or private road without the written permission of the owner or authority concerned.

1.8 Fuel supplies

The Contractor shall arrange for obtaining, storing and distributing all fuel oils required for the completion of the Works. The storage of fuel on site shall comply with the Petroleum Act and or Factories Act applicable in Kenya. Copies of this can be purchased by the Contractor at the Government Printer.

1.9 Telephone and Communications

The Contractor shall obtain suitable means of communications during the course of the Contract. The use of radio communications may be permitted but the Contractor shall be responsible for obtaining all the necessary permission and licenses.

1.10 Preservation of trees

No tree shall be removed without prior written permission of the Engineer who will limit the removal of trees to the minimum necessary to accommodate the Permanent Works.

If trees are removed or damaged by the Contractor or his employees, without approval, then the Contractor shall replace such trees.

Replacement of trees shall be with conditions; more than two years of age, obtained from a reputable nursery and of a species approved by the Engineer. The Contractor shall plant, water and ensure that the replacement trees are properly established, all at his own cost.

1.11 Protection from water

The Contractor shall keep the whole of the Works free from water and shall be deemed to have included in his Contract Sum all costs for pumping, shoring, temporary drains, sumps and other measures and provisions necessary for such purposes and for clearing away and making good to the satisfaction of the Engineer any damage caused thereby.

1.12 Protection against Fires

The Contractor is advised that, at all times, it is necessary to guard against fires starting within the Site or in the environs thereof, particularly as the result of the Works or from the actions of his employees. The Contractor shall have available, at all times, a trained fire-fighting team provided with adequate fire-fighting equipment and shall deal with all fires on the Site howsoever caused.

The Contractor shall be responsible for maintaining qualified firefighting crew on the Site at all times as well as maintaining an efficient fire alarm system. The Contractor shall also submit a fire prevention and fire-fighting program for the Engineer's approval.

The Contractor shall provide suitable and adequate firefighting equipment, to the satisfaction of the Engineer, for ready use at all the times in the entire Engineer's site establishment including Contractor's residential quarters, labor camps and ancillary buildings. These shall be maintained until the completion of the construction and handing over of the works to the Employer.

The Contractor shall comply with laws and regulations regarding fires and with respect to the prevention of fires. No fire may be lit in the dry season without written permission from the Engineer and/or the relevant Authority.

1.13 Safety precautions

The Contractor's attention is drawn to the Circular Ref: KA/17/A/2(4) from Factories Inspectorate, Ministry of Labour, Notice No.79 gazetted in the Kenya Gazette No. 56 (Legislative Supplement No.38) in respect of the appointment of Safety Supervisors on Building and Works of Engineering Construction. In accordance with this requirement, the Contractor shall appoint a Safety Supervisor who shall be qualified in safety and familiar with the works being performed. The Safety Officer shall ensure that adequate measures and rules for the protection of health and safeguarding against accidents are enforced.

The Contractor shall take all necessary precautions against risks of loss of life or of injury to any person employed on the Works or to employees of the Employer and to the Engineer or to visitors or to persons having good and sufficient reasons to be about the Works, and to this end he shall properly safeguard the Works to the satisfaction of the Engineer.

The Contractor shall at all times comply with any accident prevention regulations and any safety regulations peculiar to the various trades employed on the Works, and any safety regulations published by the Government.

The Contractor shall report promptly to the Engineer all accidents involving the death of or serious injury to any person on the Site or resulting from the Contractor's operations.

The Contractor shall, at his own expense, educate all his employees on safety precautions based on good practice on site. This shall be done in both English and Kiswahili languages. Safety instructions shall deal with all safety measures including but not be limited to the following; protective clothing, helmets and footwear, use of lifting equipment, precautions against electrical shock, welding, routine procedures in case of accidents, fires, etc. Watchmen, warning notices and barriers, use of drilling equipment and dust suppression and use storage of explosive.

1.14 Explosives and Fuels

The Contractor shall make arrangements to transport, store and handle explosives and fuels in a safe manner for protecting the public in accordance with the laws and regulations in force in Kenya. In this regard, he shall submit a program to the Engineer for approval for the safe handling and storage of explosives and fuels. When approved, the Contractor shall issue a copy to each of his personnel involved with the handling of explosives and fuels.

The Contractor shall obtain all necessary licenses and shall pay all fees and charges in respect of the same as maybe necessary for the purpose of moving explosives and

fuels from place to place and storing the same, and shall make all applications and obtain approvals from the relevant authorities of the Government of Kenya.

The Contractor shall construct his explosives magazines at locations and in a manner complying with the relevant regulations of Kenya and approved by the Engineer. Detonators and fuse shall be stored in a separate magazine away from explosives. In no case shall they be transported in the same vehicle with explosives.

The Contractor shall provide adequate protective facilities to safely store and to prevent the loss or theft of explosives. Overnight storage of explosives and detonators outside of the magazines will not be permitted. Magazines shall be securely locked when not in use.

The Contractor shall maintain an inventory record of storage and withdrawal of all explosives including detonators. This record shall be available to the Engineer, and the Engineer shall be promptly notified of any loss or theft of explosives.

The Contractor shall supply and install sirens and loudspeakers systems, so that adequate warning may be given to all persons who may be endangered when explosives charges are to be fired. The Contractor shall ensure, prior to discharging explosives, that the area to be blasted is clear of all workmen, residents, pedestrians etc. In addition, he shall post flag men on each of the roads entering the said area so as to stop and prevent any traffic from entering into the area until all clear notifications given.

During thunderstorms and other electrical disturbances, no charging will be permitted.

1.15 Above Ground Fuel Storage Tanks

The fuel storage tank shall comply with BS21, 1387, 799, 2594 and 5410 and shall have internal working pressure up to and including 0.4 bars, measured at the top of the tank, and a maximum internal vacuum of 10m bar. Unless otherwise shown on the drawings, the tank shall have a man hole whose center shall be 450mm from one end. Filling point shall be fitted to the highest point in the tank shell and dip point shall be fitted preferably at the center of the manhole lid. The Contractor shall supply the dip stick.

The drain point shall be fitted at the lowest point in the tank and flush with the inside of the shell. This shall be at a minimum of 150mm from the ground level. The draw of shall be welded near the base of the tank on the vertical center-line and at the opposite end to the drain.

The tank shall be suspended from the ground by saddle supports and the bond between the tank and the supports shall be broken by application of bituminous paint on the tank and the saddles. The tank shall be fitted with lifting tugs/hooks of sufficient strength at locations shown on the drawings. The location of the tank shall be firm ground with reinforced concrete slab with a provision of catch pits and sumps of

sufficient capacities and to the satisfaction of the Engineer. A bund wall shall be provided round the hard-standing concrete slab.

The tank shall be earthed in accordance with BS7430 AND 6651. The earth system shall terminate with copper earth rod in earth test pit.

1.16 Watching, Fencing and Lighting

The Contractor shall employ competent watchmen to guard the Works both by day and night.

Any excavations, material dumps, spoil dumps or other obstructions likely to cause injury to any person or thing shall be suitably fenced off and at night marked by red warning Lights.

Fences shall consist of at least three 15mm diameter hemp ropes or 4mm diameter wires, or more if required, stretched tightly between poles, and standards secure in solid ground, well clear of the excavation. The poles, and standards shall not be more than 15m apart, and where circumstances require, they shall be placed close. Ropes or wires shall be stretched tight approximately 0.4m, 0.8m and 1.2m respectively above the ground. Banks of spoil may be accepted by the Engineer in lieu of fencing if of suitable height and form.

Fences and spoil banks shall be clearly marked at the ends, all corners, and along the length at intervals of not more than 15m by means of white lime washed boards, discs, stones or oil drums during the day time and by red lamps burning at night. Markers shall be freshly lime washed at regular intervals to ensure that they are white and clean.

If a road is closed, or partly closed to traffic, temporary traffic and barricades shall be erected by the Contractor to the satisfaction of the Engineer and the police, or other relevant authority, to give proper warning to traffic and the public. Lettering on road signs shall be black on a yellow background and shall incorporate reflective material. The signs shall be adequately illuminated at night.

1.17 Soil Conservation

All precautions shall be taken by the Contractor to prevent the erosion of soil from any lands used or occupied by the Contractor for the purpose of the execution of the Temporary Works.

If in the opinion of the Engineer, the Contractor's operations in areas other than the permanent works caused soil erosion, the Contractor shall undertake soil conservation measures in these areas as directed by the Engineer. The details of the proposed soil conservation measures shall be submitted by the Contractor for the Engineer's approval prior to the execution of the said works.

All soil conservation measures shall be carried out at the earliest possible time, as approved by the Engineer, to ensure that the required protection is established most effectively during the progress of Works.

No separate payment will be made for the soil conservation measures and such costs shall be deemed to be included in the respective unit rates and the Contract Sum

1.18 Dust Abatement

During the performance of the work the Contractor shall carry out proper and efficient measures wherever and as often as necessary to reduce the dust nuisance resulting from his operations. Measures shall include, but not be limited, to installation of dust suppression unit on his rock drilling equipment, watering down of excavated material during loading operations, and use of water tankers to sprinkle access roads, disposal areas, etc.

The Contractor shall be held liable for any damage to crops, cultivated fields and dwellings of persons in the neighborhood of the Works resulting from his operations.

No separate payment will be made for the dust abatement measures and the costs there of shall be deemed to be included in the respective unit rates and the Contract Sum

1.19 Noise Control

All work shall be carried out without un reasonable noise. Compressors used on site shall be silenced either by using only full silenced models or fitted with effective exhaust silencers and properly lined and scaled acoustic covers all to the design of the manufacturers of the compressor or by the use of effective acoustic screen stone close the noise source. Pneumatic percussion tools used on site shall be fitted with silencers of a type recommended by the manufacturers of the tools. Compressors, silencers or other equipment shall be maintained in good and efficient working order.

No separate payment will be made for noise suppression measures and the costs thereof shall be included in the unit rates and the Contract Sum.

1.20 Sanitation

The Contractor shall provide adequate sanitation and refuse collection and disposal facilities complying with state laws and local by-laws for all houses, offices, workshops, and the like, erected on the site, all to the satisfaction of the Engineer.

The toilet facilities provided at the site by the Contractor shall be made available, free of charge, to the employees of the Contractor and any contractors.

The Contractor shall warn his employees and sub-contractors that any employee found fouling the site shall be removed from the site immediately in accordance with the Conditions of Contract.

The Contractor shall remove all rubbish and to this end shall provide adequate number of covered garbage bins/containers placed at convenient points around the site establishments. The Contractor shall institute and maintain a regular garbage collection and disposal system. Garbage shall be disposed of by burial or by other means approved by the Engineer.

No separate payment will be made for such sanitary arrangements and all such costs will be deemed to be included in the unit rates and Contract Sum.

1.21 First Aid and Medical Services

The Contractor shall provide and maintain all equipment necessary to render First Aid in case of accidents, snakebites or other emergencies. This equipment shall be kept in readiness at the sites of the works, at camps and wherever the Contractor's staff may regularly live and work. The Contractor shall ensure that there are persons available to all such places with knowledge of simple First Aid procedures and able to administer snakebite treatment.

Notwithstanding the minimum requirements prescribed above, the Contractor shall be responsible for the adequacy of all the arrangements made.

1.22 HIV/AIDS awareness

The Contractor shall implement an HIV/AIDS awareness Programme for his Personnel.

During the execution of the Works, the Contractor shall ensure that no pollution of existing water courses is allowed to take place as a result of his operations. The Contractor shall take all reasonable steps to protect the environment on and off the site and to avoid damage or nuisance to persons or to property of the republic or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

1.24 Restoration of Drains, Streams, Canals

Subject to any requirement of the Works whereby a permanent change is to be done, all drains, canals, pipes, channels, water-courses or streams temporarily cut through or disturbed by the excavation of the Works are to be restored so that the water flowing in them may continue to flow in as full and free manner as it did before the disturbance.

1.25 Site Clearance

On completion of the Works, the Contractor shall clear the site and remove all temporary buildings, equipment and debris. The Contractor shall level off and grade all areas used for haul roads and all building, store and workshop areas. The whole of the site shall be left in a clean and tidy condition.

1.26 Weather Records

The Contractor shall erect a rain gauge ("Nylex 600" or similar approved) and a double bulb, minimum/maximum thermometer (0.1° Accuracy) at a site agreed with the Engineer. The Contractor shall be responsible for the daily measurement of rainfall and minimum and maximum temperature to be taken at 8:00a.m each day.

1.27 Tolerances

All works shall be constructed to the tolerances shown in Section 8 of these specifications.

1.28 Units and Abbreviations

The units of measurement used in these Contract Documents are metric.

The following abbreviations have been used for units and for other words or phrases as indicated.

Abbreviations in the Contract Documents shall have the following meanings:

mm	millimeter	m	meter
km	kilometer		
sq., m ²	squaremetre		
ha	hectare		
cum, m ³	cubicmetre		
sec, s	second		
min	minute		
wk.	week		
l	litre		
gm	gram		
kg	kilogram		
t	tons		
No	Number		
Nr	Number (in bill of quantities)		
dia	diameter		
max	maximum		
min	minimum		
AD	above datum (levels in metres)		
ch	chain age (distance in metres)		
eo	extra over		
e	exceeding		
ne	not exceeding		
PQ	Provisional Quantity		
PS	Provincial Sum		
Do	Ditto		
fob	free onboard		
cif	cost, insurance, freight		
wt	weight		
%	percent		
mh	manhole		
ic	inspection chamber		
HYS	high yield steel		
PCC	precast concrete		
UPVC	plasticized polyvinyl chloride		
GMS	galvanized mild steel		
DI	ductile iron		
SV	sluice valve		
ISO	International Standards Organization.		
S	Kenyan Standard		

2. EARTHWORKS

2.1 Site Clearance and Stripping

General clearance is defined as the clearing, grubbing, (removal and disposal of all vegetation, grass, debris, bushes, dense bush, trees, hedges, undergrowth, stumps, roots, shrubs, plants and backfilling of holes left by the removal of stumps and roots.

The widths and lengths over which site clearance is to be carried out shall be instructed by the Engineer. Site clearance over the area of quarries, borrow pits, stockpiles and spoil tips shall be carried out where instructed by the Engineer. The Engineer may give instructions that specific trees, stumps or objects shall not be removed during site clearance operation.

If termite molds are excavated, the whole of the mould shall be removed.

Where the Engineer instructs that site clearance is required, the entire area shall be cleared and all materials thus cleared shall become the property of the Employer. Unless otherwise instructed, vegetation and perishable materials shall be carted to spoil areas, which spoil areas shall be provided in accordance with requirement of this Specification.

If the Contractor clears the Site in advance of the main Works such that the grass and other vegetation re-grows prior to the main Works commencing at any particular location then any additional, or repeating of, site clearance required shall be at the Contractor's expense.

When instructed by the Engineer, the Contractor shall demolish wholly or in part, remove and dispose of all buildings, foundations, structures, fences and any other obstructions which have not been designed to remain.

The Contractor shall carefully take down such buildings, structures, fences etc. and the components shall be dismantled, cleaned and stacked in separate heaps. All materials which, in the opinion of the Engineer, are not fit for re-use shall be removed from the site topsoil areas provided in accordance with the requirements of this Specification. All materials, which are re-usable, shall remain the property of the Employer and shall be preserved and protected by the Contractor until removed by the Employer or until the expiry of the Defects Liability Period.

All existing paths, fences, walls, hedges, trees, shrubs, lawn and other features which the Engineer instructs not to be removed or otherwise dealt with, shall be protected

from the damage, and any damage which occurs due to the Contractor's failure to take adequate precautions shall be repaired at the Contractor's expense.

Site clearance shall be measured in square meter, calculated as the plan area instructed by the Engineer to be cleared. The rate for the site clearance shall include for the cost of complying with the requirements of Clauses 2.1, 2.13 and 2.14.

Stripping work shall basically consist of removal of top soil, grasses, vegetative material to a depth of 150mm below ground level and its disposal to a stockpile. Stripping shall include for removal, stockpiling and for reinstatement or spreading as directed by the Engineer.

Measurement and payment of this shall be in square meters, calculated as the plan area instructed by the Engineer.

2.2 Surface Levels

After the area of any section of the Works has been cleared and after trees have been felled, stumps removed and termite mounds excavated to the satisfaction of the Engineer, but before any other work is commenced, surface levels of the ground shall be taken. The levels shall be taken at spacing agreed with the Engineer. Levels shall similarly be taken on the surface of the ground after the removal of unsuitable overburden prior to placing fill and at the interface between natural ground, rock or artificial hard material layers. The levels shall be agreed with the Engineer. The Contractor shall prepare plan and sections which shall, when finally, and mutually agreed, be signed by the Engineer and Contractor as truly representing the configurations of the areas in question at the commencement of excavation or fill construction.

2.3 Definition of Earthworks

The following definitions of earthworks materials shall apply to this and other Clauses of the Specification in which reference is made to the defined materials:

- "top soil" shall mean the top layer of soil that can support vegetation;
- "Suitable material" shall comprise all material which arises from excavations within the Site and which is approved by the Engineer as acceptable for use in the works;
- "Unsuitable material" shall mean material other than suitable material and shall comprise:
 - Material from swamps, marshes and bogs,
 - logs, stumps and perishable materials,
 - material susceptible to spontaneous combustion,

- clay of liquid limit exceeding ninety (90) and/or plasticity index exceeding sixty-five (65).

“Rock” or “hard material” shall be material which cannot be ripped to an average depth of greater than 300mm by a track type crawler tractor complying with the following:

- in good order complete with all equipment and accessories as supplied;
- rated 300BHP fly wheel power or over;
- with an operating weight of not less than 37.2 tones;
- equipped with a hydraulically operated single tine ripper compatible with the tractor used; and
- Operated by a qualified operator in accordance with the manufacturer's recommendations and to the satisfaction of the Engineer.

Where it is impractical to prove hard material by the above method then the quantity of hard material, if any, shall be determined by the Engineer.

Where excavation contains individual boulders of hard material greater than 0.3m³ each in volume then such boulders shall be classified as hard material.

“Soft material” material shall mean all material other than that defined as “rock” or “hard material”.

2.4 Removal of Unsuitable Material

Where directed by the Engineer the Contractor shall remove unsuitable material to the depth as ordered or agreed by the Engineer and shall dispose of it in approved spoil tips.

2.5 Excavation General

Excavation shall be carried out with the allowances for working space given in the Method of Measurement to the Bill of Quantities, unless otherwise shown as lines, levels and profiles on the Drawings or to such other lines, levels and profiles as the Engineer may direct or approve in writing. The work shall be carried out by the Contractor in such a way as to avoid disturbance to the surrounding ground. Particular care shall be taken to maintain stability when excavating in close proximity to existing works.

The work shall be carried out in a careful manner to ensure that the exposed surfaces are as sound as the nature of the material permits and that no point shall protrude inside the lines shown on the Drawings except as otherwise specified or agreed by the Engineer. In soft excavation which is to remain open permanently, exposed faces shall be formed accurately to the required slopes and profiles. Excavations in rock where the faces shall remain open permanently shall be trimmed so that no point protrudes within the required profile.

The Contractor shall examine all excavated faces regularly and shall remove all insecure material or materials resulting from any falls, the Contractor shall wash down exposed surfaces of excavated rock for inspection.

The Contractor shall dispose of all material arising from excavations. If it is suitable and required for the Permanent Works it shall be placed directly in such Works or set aside for use as and when required in suitable approved dumps, otherwise it shall be removed to tips provided by the Contractor unless otherwise provided or directed by the Engineer.

The Contractor shall be responsible for keeping all excavations free from water from whatever cause arising and shall provide such pumping capacity and other measures as may be necessary for this purpose. The Contractor shall make good any damage that may result from his failure to keep the excavations free from water.

All excavation shall be carried out with care and the method and Contractor's equipment to be used in execution thereof shall be to the satisfaction of the Engineer. The Contractor shall provide timbering, shoring or other measures required by the Engineer to prevent movement or loss of ground outside the boundaries, settlement or damage to property, or injury to persons. The Contractor shall make good any damage to structures, services or other properties caused by such movement, loss of ground and settlement. The Contractor shall also take precautions to route his equipment in such a manner as to minimize the likelihood of slips occurring due to vibration or surcharge from the working or movement of heavy machinery.

The Contractor will be permitted, subject to the approval of the Engineer, to adjust side slopes of excavations in soft materials which are to remain open temporarily in preference to shoring or strutting. However, no payment shall be made for extra excavation volume as a result of these measures.

The Contractor shall notify the Engineer without delay of any permeable strata, fissures or unusual ground encountered during excavation.

2.6 Blasting

The Contractor shall not be permitted to use explosives for rock excavation without the approval of the Engineer. The Contractor shall only employ suitably qualified and experienced personnel to manage and supervise blasting operations. For each blasting operation, the Contractor shall submit to the Engineer for approval a statement detailing the type of explosives to be used, method of transport, storage, blasting procedures, safety precautions to be observed and the names and experience of the personnel who will supervise the work. Notwithstanding the Engineer's approval, the Contractor will be responsible for the blasting operations and shall accept full and absolute liability for any claims resulting either directly or indirectly from the use of explosives on the Site.

The blasting operations shall comply in every respect with the regulations and laws covering the use of explosives and the Contractor shall be responsible for obtaining all necessary permits.

2.7 Excavation beyond Line or Level

If from any cause whatsoever excavations are carried out beyond their true line and level other than on the instructions of the Engineer, the Contractor shall make good to the required line and level with the appropriate grade of filling to be contained in the true excavation, or with concrete or other approved material in such a manner as the Engineer may direct. This shall be at the Contractor's expense.

2.8 Approval of Excavation

When excavations have been taken out accurately to the profiles or dimensions required for the work the Contractor shall inform the Engineer who shall carry out an inspection of the excavation. If after his inspection the Engineer requires additional excavation to be carried out, the Contractor shall do so to such new profiles or dimensions as the Engineer may direct.

2.9 Excavation for Structures

Open excavation to form a foundation for a structure shall be carried out to the lines necessary to permit the proper construction of the structure to the approval of the Engineer.

Where a structure is to be founded on soft ground, the excavation shall be taken down until the required formation is exposed and prepared to the approval of the Engineer. Where concrete has to be placed on a soft foundation, the Engineer may direct that a blinding layer of lean concrete be placed beneath the structural concrete immediately after completion and approval of the excavation, or require the Contractor to remove the last 100mm of excavation immediately prior to placing the concrete. If foundation conditions are very soft the Engineer may instruct that additional material be excavated and replaced with compacted gravel or hardcore.

Where a structure is required to be founded on rock but is not required to penetrate into it, all soft overburden shall be removed and the surface of the rock cleared of any loose material by barring and wedging. Where the foundation is required to penetrate into the rock, excavation of the rock may be carried out by blasting but in such a manner as to prevent the shattering of the rock which is to remain. The Engineer may direct that the last 300mm of rock be left and be removed by barring and wedging or by the use of approved pneumatic tools so that the exposed surface is sound. The Contractor shall report to the Engineer whenever excavations are ready to receive concrete. No concrete shall be placed in the foundations until the Contractor has obtained the Engineer's agreement that a secure foundation has been reached and that the excavation has been carried out to the lines and levels required.

2.10 Excavation for Fill Foundation

Foundations for embankments shall be excavated to the depths or to the soil or rock grade indicated on the Drawings or described in the Specification. The suitability of each part of the foundation for placing fill there on shall be determined by the Engineer. No fill shall be placed before acceptance of the foundation by the Engineer and recording of the geology.

Where specified in the Drawings or Specification or directed by the Engineer, seams and other defects below the general level of the foundations shall be excavated and filled or covered with materials including mortar and concrete to the satisfaction of the Engineer before fill is placed there on.

Where embankments are to be constructed on sloping ground, and where shown on the Drawings, benches shall be excavated in the foundations to the dimensions shown on the Drawings.

Except where specifically permitted by the Engineer all foundations for fill shall be kept free of water when placing fill thereon.

Earth foundations shall have the top 150mm sufficiently moistened and, if necessary, harrowed or scarified and compacted to at least ninety five percent (95%) of the maximum dry density as determined by the AASHTOT99. Material too wet to be so compacted shall, as directed by the Engineer, be allowed to dry, harrowed or scarified to reduce the moisture content to the required amount and then be re-compacted.

2.11 Trench Excavation

Trench excavation shall be performed by the use of hand tools and approved mechanical equipment, in such manner as to minimize disturbance of the sides and bottom of the excavation.

Trenches for pipes shall be excavated to a sufficient depth to enable the pipe and the specified joint, bedding, hunching and surround to be accommodated. Unless otherwise stated, the width of the trench shall be equal to the nominal diameter of the

pipe plus 600mm.

The Contractor shall fill any over excavation beneath the pipe or bedding at his own cost with well rammed selected general excavation material as per requirement of this Specification. The Contractor shall dispose of surplus excavated material not required for backfill to spoil tips.

The sides of trenches shall be adequately supported at all times. Alternatively, where the Contractor has to excavate the trenches in open cut the Contractor shall ensure that the side slopes of the excavation are sufficient for stability.

Where rock or boulders are present in the sides or base of a trench in which a pipe is to be installed, the trench shall be trimmed so that when the pipeline is laid, no projection of rock comes within 200mm of the outside of the pipe at any point. The over excavated portion shall be backfilled as set out in this Specification with approved granular material at the Contractor's expense.

The Contractor shall be entirely responsible for the sufficiency of all temporary supports and side slopes to the excavations. The excavation shall be carried out in such a way as to maintain the stability of all roads and other adjacent structures or works.

2.12 Channel Excavation

The excavation of all channels shall be executed in such a manner as to ensure that the stability of side slopes is not endangered. Should slips or under cutting occur for reasons attributable to the Contractor's negligence or method of working, the Engineer will give instructions for remedial works to be carried out by the Contractor at the expense of the Contractor.

Where channels are to be reshaped, cleared and trimmed, the width, depth, side slopes and centerline radius shall be as shown on the Drawings. The Contractor shall clear all weeds and growth from existing channels and grade the beds to required levels. The area of water way shown is the minimum required and sides of channels shall be trimmed to the required slope so as to provide widths not less than those shown on the Drawings.

Any channels, streams, drains or pipes taking water to or from cultivated land shall be diverted so as to maintain their flow before being moved or broken into unless express permission to the contrary is given by the Engineer. All diversions and their subsequent reinstatement are to be carried out to the satisfaction of the Engineer. The Contractor shall be deemed to have included the cost of dealing with this in his rates.

Side banks of channels shall be trimmed to a neat appearance and even surface.

In the construction of channels and embankments a local balance of cut and fill shall be maintained as far as possible unless the cut is unsuitable material or is specified in the drawings that the fill should be imported. A deficiency of fill material shall be made up by bed borrow or gleaning. Surplus material, if suitable and approved by the Engineer may be used for an increased width of embankment otherwise it may be spread at the toe of the embankment or placed on spoil tips as directed by the Engineer.

Where required the Contractor shall control the rates of filling and draw-down of water in channels so as not to endanger the stability of earth works.

2.13 Disposal of Excavated Material

Material obtained from excavations which are suitable for forming embankments or other fill areas shall be placed directly in the Works or set aside for use as and when required in suitable approved dumps. Any such suitable material which may be surplus to the total requirements of the Works shall be taken to spoil in tips provided by the Contractor, unless otherwise provided or permitted by the Engineer.

If the Contractor is permitted to remove suitable material from the site to suit his operational procedure or to take such material for purposes other than forming embankments or other fill areas, he shall make good any consequent deficit of filling arising there from, unless otherwise agreed by the Engineer.

All material not suitable for embankments or other filling shall, unless otherwise directed by the Engineer, be taken to separate spoil tips provided by the Contractor.

The cost of disposal of surplus or unsuitable materials shall be deemed to be included in the respective unit rates for the excavation work and the Contract Sum.

2.14 Spoil Tips

The Contractor shall be responsible for the provision and sufficiency of tips for the permanent disposal of spoil and shall select their location within the general areas indicated on the Drawings or as otherwise designated or approved by the Engineer. The Contractor shall submit his proposals for the locations and detailed treatment of tips to the Engineer for approval, which will in no way relieve the Contractor of his responsibilities and obligations under the Contract, whether or not locations are shown on the Drawings or otherwise designated.

No spoil shall be permanently deposited elsewhere than on approved spoil tips unless approved by the Engineer. Spoil tips shall be built up and compacted and trimmed and regulated to levels and profiles approved by the Engineer. Where directed by the Engineer, upper surfaces and slopes of the tips shall be soiled to specified thickness.

2.15 Borrow Pits and Quarries

Where there may be an insufficiency of suitable material from excavations for filling or is specified on the drawings, the Contractor shall obtain such material from borrow pits or quarries approved by the Engineer where the filling is required for Permanent Works. The Engineer may propose a borrow pit for exploration by the Contractor, however, it shall be entirely the responsibility of the Contractor to locate suitable sources of borrow material for fills.

The Contractor shall investigate the site or sites which they propose to open up and shall provide full and detailed information by means of boreholes, trial pit testing

reports, etc. to satisfy the Engineer that the quality of the material meets Specification requirements and that the quantity is adequate for the Works.

Notwithstanding the foregoing, the Engineer shall have the right to order the Contractor to obtain materials from a particular designated source or by widening cuttings for permanent works beyond specified profiles.

excavating, loading and transporting material of the specified quality for completion of the Works in accordance with the agreed programme. These provisions shall include where necessary for any operations involving selection, stock piling and re-handling of suitable material, the disposal of unsuitable material or over burden and any other operations which may be found necessary due to the nature and position of the excavated materials.

The pits and quarries shall be operated in a safe manner provided with ample drainage leaving no stagnant pools. On completion of the Works they shall be left free-draining and in a tidy and regular state. All loose material shall be barred down and no face shall be left over hanging except with the approval of the Engineer.

The removal of vegetation, top soil and over burden at the borrow pits shall not be paid for separately. Contractor will be deemed to have allowed for the costs elsewhere in his rates. The same applies to any works required to access the borrow pits.

The rate for fill shall include for the supply of material inclusive of extraction, loading and transportation to Site for a maximum haulage distance of 30km, one way. Where suitable borrow pit is not available within this distance, overhaul will be paid for. Measurement shall be the product of the volume of compacted material inside and the haulage distance in excess of 30km, one way, along the shortest route, as determined by the Engineer. The Contractor shall be responsible for the maintenance of this selected route, at his own cost.

2.16 Earth Filling

Material for filling shall be obtained from approved sources and shall not contain more than 1% of vegetation matter, rubbish and humus material and shall contain no boulders or rock of a size greater than half the compacted thickness of the layer. No material shall be used which is so uniformly graded that D_{60} divided by D_{10} is 4 or less, where D_{60} and D_{10} are sizes such that 60% and 10% by weight of the particles are finer than D_{60} and D_{10} respectively.

Unless otherwise specified the fill material for the stilling basin embankments shall meet the following requirements:

- CBR after 4 days soaking compacted to 100% of AASHTOT99 at optimum moisture content of not more than 3%.
- Plasticity Index (PI) of more than 40%.

- Permeability of less than 1×10^{-6} mm/s

Prior to commencement of filling, the Contractor shall submit in writing to the Engineer for approval his proposals for carrying out the work such that the optimum use may be made of excavated material as far as possible. The proposals shall include the compaction equipment and methods for adjusting the moisture content of the material which he intends to use. No filling shall be carried out until the proposals and the material intended to be used are approved by the Engineer.

Fill shall be placed in layers not exceeding 150mm compacted thickness, each layer being scarified and thoroughly compacted to obtain a dry density not less than 95% of the maximum dry density as determined by AASHTOT99. The moisture content shall be adjusted as necessary to achieve the compaction standards.

The Contractor shall take all necessary measures to prevent any damage or defects to the Works which may be caused by settlements, slips or falls of embankments and shall make good such damage or defects as may occur to the satisfaction of the Engineer, all at his own cost.

Any instability of any adjacent excavation resulting from the embankment not being formed to the lines, levels and profile shown in the Drawings or as ordered by the Engineer will be the responsibility of the Contractor. Where double-handling of excavated material is necessary, the Contractor will be responsible for the temporary disposition of the material such that it does not endanger the stability of the excavation.

2.17 Backfilling of Structural Excavations

Backfilling of structural excavations shall be carried out with excavated material selected or approved by the Engineer. The material shall be placed in layers not exceeding 150mm compacted thickness or such other thickness as the Engineer may approve or direct and shall be compacted as specified in Clause 2.16.

When material is filled up to or over any structure, the filling shall be brought up equally on each side or as otherwise agreed by the Engineer so that no unequal pressures likely to cause damage to the structure are applied.

2.18 Filling under raised foundations

The material to be used as filling under raised foundations shall consist of suitable material obtained from adjacent excavations or approved borrow sources, and shall be placed in layers not exceeding 100mm compacted thickness. The material shall be compacted in accordance with Clause 2.16.

2.19 Frequency of Testing

Testing will be carried out as instructed by the Engineer with the following being the minimum testing frequencies:

- Field Dry Density Moisture Content Test. Every 500m² of compacted fill layer placed or at least 2 tests in any one length of compacted fill, whichever is greater.
- Particle Size Sieving Analysis, Atterberg Limits and AASHTO T99 test. Every 1000 cubic meters of compacted fill or at least 2 tests in any one length of compacted fill, whichever is greater.
- The apparatus for these tests and the manner in which they are carried out will be as described in BS 1377/1990 and AASHTO T99. All results of these tests shall be submitted to the Engineer with the least possible delay.

2.20 Granular Bedding

Granular bedding material shall comply with BS EN 12620 for aggregates within the size range 14mm to 5mm. Material complying with BS EN 12620 except in respect of grading may be used provided that it has a maximum size not exceeding 14mm.

2.21 Grassing

Before planting grass, all areas to be planted shall be cleared of stones and any other non-organic matter. Planting shall be carried out when directed, and the Contractor shall keep all grassed areas watered and weed free until the expiry of the Defects Liability Period. Any areas which have failed shall be replanted by the Contractor, at his own expense.

2.22 Slopes and Batters

Where a slope is given in the Specification or on the Drawings as a ratio of vertical and horizontal components, it shall be understood that the first component is vertical in all cases example. "A slope of 1 in 2" will mean one vertical in two horizontal and a "batter of 4 to 1" will mean four verticals to one horizontal. This meaning will be attributed to all other terms such as "inclination and gradient".

2.23 Trial Pits

The Contractor shall excavate, maintain and afterwards refill any trial pits ordered by the Engineer. The sides of the pits shall, where deemed necessary by the Engineer for safety purposes, be supported by sheeting or boarding with adequate framing. A ladder shall be provided for inspection purposes.

2.24 Sheet Piling

Where shown on the drawings or instructed by the Engineer the construction of sheet piling shall comply with the codes of practice for earth retaining structures, BS 8002:1994

3. CONCRETE

3.1 Concrete General

Concrete shall consist of cement, graded aggregate and water carefully proportioned, thoroughly mixed, placed and compacted as specified.

The Contractor shall obtain formal approval from the Engineer before pouring any concrete for the permanent works. The Engineer shall allow concreting after ascertaining the required lines and levels, suitability of form work, availability of required equipment and labor, proper fabrication and spacing of the steel bars and quality and quantity of cement and aggregates.

3.2 Cement

Cement for use in the permanent works shall be Ordinary Portland Cement from an approved manufacturer and shall be type CEM I 32,5N complying with BS EN 197-1. Where sulphate-resisting cement is specified, it shall comply with BS4027.

All cements shall be certified by the manufacturers as complying with the requirements of the specification. Before orders are placed the Contractor shall submit details of the proposed supplier(s) together with such information on the proposed methods of transport, storage and certification so that the Engineer may satisfy himself that the quantity and quality required can be supplied and maintained throughout the construction period. Where necessary the Engineer may require representative samples of the proposed cement to be taken and forwarded to a nominated laboratory for analysis and testing before the source is approved.

No cement shall be used in the Works until deemed satisfactory by the Engineer.

3.3 Supply of Cement

Cement shall be obtained from one manufacturer unless otherwise authorized by the Engineer. Should the use of cement from different manufacturers be authorized, the different supplies of cement shall be stored separately and shall not be mixed.

The Contractor shall supply to the Engineer copies of the manufacturer's test certificates certifying that each consignment of cement has been tested and analyzed, and that the results comply in all respects with the above standards. Each certificate shall state clearly the date of dispatch and the number of bags dispatched in each consignment.

Bagged cement shall be delivered in sealed 50 kilograms sacks. Each bag shall be marked with the parcel number of the cement contained. Bagged cement shall be transported so that at no time is it exposed to damp and so that moisture cannot be absorbed from the atmosphere.

Cement in bulk shall be transported into tally enclosed water tight and sealed containers.

If cement is obtained from an intermediate agent, such agent's arrangements for transporting and storing cement shall be to the approval of the Engineer.

3.4 Storage of Cement

The Contractor shall provide sufficient storage capacity on Site to ensure that his anticipated programme of work is not interrupted due to lack of cement. Factors outside the Contractor's control such as transport, weather conditions, holidays and breakdowns shall be taken into account.

Cement delivered to the Site in bulk shall be stored in dry, well-ventilated weather-proof silos or bins which shall be self-clearing. Cement delivered to the Site in bags shall be stored in dry, weather-proof sheds which shall have floors of damp-proof construction raised at least 150mm above the surrounding ground.

Cement of different consignments shall be stored separately and consignments shall be used in the same order as they are delivered to the site. No cement shall be stored on the site for longer than three months from the date of dispatch by the manufacturer. If not used within that period, the cement shall be removed from the site.

Any bag of cement which is damaged or found to contain cement which has set or partly set, shall be discarded and not used in the Permanent Works.

3.5 Testing of Cement

Cement shall be tested by the manufacturer. If the manufacturer's test certificate is not made available, representative sample shall be taken from different bags or containers of each consignment. They shall be suitably packed and sent to an approved laboratory for testing to prove the cement's compliance with the specified standards.

The Engineer may require cement to be tested after its delivery to the site. Any cement which has been in store at the site for longer than one month shall be re-tested.

The Engineer may take samples of cement from cement bins or bagged cement, from a parcel of cement after its delivery to the site, or from a parcel of cement which has been stored at the site for longer than one month.

In addition to the manufacturer's tests the Engineer may require the following tests to be carried out to BS EN 196-3:

- Compressive strength; ▫
- Soundness.

Any cement which fails to meet the specified requirements shall not be used in the Permanent Works.

3.6 Aggregate for Concrete

1. General

Aggregates for concrete shall comply with BSEN12620, and shall be obtained from a source or sources approved by the Engineer and shall be transported and stored in such a manner as will prevent:

- Contamination of the aggregates from the ground, rubbish, vegetation, dust or any other foreign material.
- Segregation.
- Inter mixing of aggregates of differing characteristics.

Before aggregates from each source are approved for use in the Permanent Works, tests shall be carried out at an approved testing laboratory on representative samples submitted by the Contractor to check that the aggregates comply with the requirements of the Specification.

During concreting operations, tests shall be carried out to check that aggregates delivered for use in the Permanent Works comply with the requirements of the Specification.

Sampling and testing of aggregates for concrete shall be carried out in accordance with the requirements of BS812 except where described otherwise.

Moisture contents of aggregates shall be determined as the moisture content of the aggregate compared with that of the aggregate in the saturated surface-dry condition. Specific gravities of aggregate shall be determined on aggregate in the saturated surface-dry condition.

Aggregates shall be stored on a clean, free draining surface. The various types and sizes of aggregates shall be kept separate from each other and each stockpile shall be kept as large as possible to maintain a reasonably uniform content in the aggregate.

2. Fine Aggregates

Fine aggregates shall be clean and durable and shall be natural sand, crushed gravel sand or crushed rocks and complying with BSEN12620. All the material shall pass through a 5mmBS sieve. In order to achieve an acceptable grading, it may be necessary to blend materials from more than one source.

As an alternative, fine aggregate for mortar only shall comply with BS1199 and 1200.

The fine aggregate shall not contain iron pyrites or iron oxides. It shall not contain mica, shale, coal or other laminar, soft or porous materials unless the Contractor can show by tests on finished concrete as set out in BS EN 12390 that the presence of such materials does not adversely affect the properties of the concrete.

The proportion of clay, silt and other impurities passing a 75 microns BS sieve shall not exceed three percent for natural or crushed gravels and or 15 percent for crushed rocks and. The shell content shall not exceed 15 percent by weight.

Chlorides soluble in a 10 per cent solution by weight of nitric acid shall not exceed 0.05 percent by weight expressed as chloride ion when tested as set out in BS 812, subject to the further restriction given in the note on total chloride content in sub-clause 3.5.5.

Soundness: After five cycles of the test set out in ASTM C88-76, the aggregate shall not show a weight loss of more than 10 percent.

Samples taken from the fine aggregate shall pass the colour test for organic impurities described in Sub-Clause 3.6.4.

Tests on fine aggregates shall be carried out daily or as required by the Engineer on site during concreting operations as follows:

- . Moisture content. An approved "rapid" test may be used for this test.
- . Percentage of material passing a 75 microns BS sieve by the Field Settling Test, checked, when necessary, by the Decantation Method.
- . Test for organic impurities as described in sub-clause 3.5.4.
- . The Contractor shall arrange to carry out the following tests when requested by the Engineer:
 - . Specific gravity and water absorption.
 - . Bulk density.
 - . Other tests described in BS 812.

3. Coarse Aggregates

Coarse aggregates shall be clean, hard and durable crushed rock, crushed gravel or natural gravel complying with the requirements of BS EN 12620. The material shall be frost resistant and shall not contain any iron pyrites, iron oxides, flaky or laminated material, hollow shells, coals or other soft or porous material, or organic matter. The pieces shall be predominantly angular, rounded or irregular as defined in BS 812.

Coarse aggregate shall be supplied in the nominal sizes called for in the Contract and shall be graded in accordance with BS EN 12620 for each nominal size.

The proportions of clay silt and other impurities passing a 75 microns BS sieve shall be not more than one percent by weight.

The content of hollow and flat shells shall not be such as will adversely affect the concrete quality when tested as set out in BS 1881. The total shell content shall not be more than the following:

- 40mm nominal size and above 2 percent of dry weight
- 20mm nominal size 5 percent of dry weight
- 10mm nominal size 15 percent of dry weight

Chlorides soluble in a 10 percent solution by weight of nitric acid shall not exceed 0.03 per cent by weight, expressed as chloride ion when tested as set out in BS812 but subject also to the further restriction on total chloride content given in sub-clause 3.5.5. When tested in accordance with ASTM C289, the aggregate shall be non-reactive.

Soundness: After 5 cycles of the test set out in ASTM C88-76, the aggregate shall not show a weight loss of more than 12 percent.

Flakiness Index: When tested in accordance with BS812 shall be as set out here under:

- 40mm nominal size and above Not more than 40
- 20mm nominal size and below Not more than 34

If the flakiness index of the coarse aggregate varies more than five units from the average value of the aggregate used in the approved trial mix, a new set of trial mixes shall be carried out in the workability of the mixes have been adversely affected by such variation.

Impact Value: Not more than 45 percent when tested in accordance with BS812.

Ten percent fines value: Not less than 50kN when tested in accordance with BS812.

Shrinkage: When mixed with other ingredients in the approved proportions for concrete and tested as set out in BS 1881, the shrinkage factor shall not exceed 0.05 percent.

Water absorption: The aggregate shall not have water absorption of more than 2.5 percent when tested as described in BS812.

Tests on coarse aggregate shall be carried out daily or as required by the Engineer on site during concreting operations as follows:

- Sieve analysis
- Moisture content: An approved "rapid" test may be used for this test.
- Percentage of materials passing a 75 microns BS sieve by the Field Settling Test, checked when necessary by the Decantation Method.

The Contractor shall arrange to carry out the following tests when requested by the Engineer:

- Determination of Flakiness Index.
- Specific gravity and water absorption.
- Determination of "ten percent fines" and of Los Angeles Abrasion.
- Other tests described in BS812.

4. Test for Organic Impurities

Aggregates shall be tested for organic impurities by means of discoloration of a sodium hydroxide solution as follows:

A 340ml graduated prescribed bottle shall be filled to the 123ml mark with a sample of the aggregate to be tested. A 3 per cent solution of sodium hydroxide in water shall be added until the volume of the aggregate and liquid after shaking gives a total volume of 194ml. The bottle shall be stoppered, shaken thoroughly and allowed to stand for 24 hours. Should the liquid then be darker than the standard colour solution the aggregate shall not be used for making concrete.

The standard colour solution shall be prepared in a 340ml prescription bottle as follows:

- 2.5ml of a 2 per cent solution of tannic acid in 10 per cent alcohol shall be added to 97.5ml of a 3 per cent solution of sodium hydroxide in water. The mixture shall be shaken and allowed to stand for 24 hours.
- A glass of the standard colour may be used in place of the standard solution.

5. Total Chloride and Sulphate Contents

The total chloride content arising from all ingredients in a mix, expressed as chloride ions as a percentage of the weight of cement in a mix, shall not exceed 0.5 per cent in any one sample or

concrete or concrete containing sulphate resisting cement or super sulphated cement, the total chloride content shall not exceed 0.5 per cent of the weight of cement in the mix.

The total sulphate content arising from all ingredients in a mix shall not exceed 0.4 per cent by weight of the aggregates or 4 per cent of the weight of cement in the mix, whichever is less. For this purpose, the sulphate contents shall be expressed as SO_3 and shall be calculated from the sulphate contents of the cement, aggregates and any admixtures. Where applicable, sulphate contents shall be determined in accordance with tests described in BS1047 and 3892.

Pulverized fuel shall not be used in conjunction with cement complying with the requirements of BS4027 in concrete required to be resistant to sulphates.

3.7 Admixtures

Admixtures for improving workability, accelerating or retarding setting of concrete, or for any other purpose, shall comply with BS EN934 and only be used with the

Engineer's written approval. Calcium chloride or ad mixture containing chlorides will, however, not be approved.

The Contractor shall submit samples of the ad mixtures he proposes to use to the Engineer for testing. If an ad mixture is approved for use it shall be obtained from an approved supplier and the Contractor's arrangement for measuring, mixing and adding the ad mixture to the concrete batch shall be strictly in accordance with the manufacturer's instructions or recommendations and subject to the approval of the Engineer.

The proportions of the concrete mixes and water/cement ratio shall be adjusted to the satisfaction of the Engineers that the strength of the concrete with admixture is at least equal to the strength of the equivalent concrete without admixture.

3.8 Water for Concrete

Clean fresh water complying with BSEN1008 is to be used for the mixing of all concrete and mortar, and is to be from a source approved by the Engineer.

3.9 Concrete Mixes

The design of concrete mixes shall be the sole responsibility of the Contractor, but may be under taken in conjunction with the Engineer. Concrete mixes shall be designed mixes in accordance with the requirements of BS5328 having the characteristics specified in Table 3.1 of this Specification. Concrete for use in water retaining structures shall comply with BS 8007.

Evidence shall be submitted to the Engineer, for all classes of concrete to be used, showing that at the intended workability the proposed mix proportions and production methods will produce concrete of the required quality.

The following information shall be provided before any designed mix is supplied:

- Nature and source of each material.
- Full details of tests on trial mix including work ability.

- Proposed quantities of each ingredient for one cubic meter of fully compacted concrete.

No change in the approved mix design will be permitted, unless the Contractor carries out trials on the proposed mix design to show that compliance with this Specification can be maintained.

Mix design shall in all cases be subject to the approval of the Engineer, but such approval shall in no way relieve the Contractor of his responsibility for the design and production of concrete in compliance with this Specification.

3.10 Trial Mixes

At least six (6) weeks before commencing the placing of any concrete in the works, trial mixes shall be prepared for each class of concrete to be used on the works. Three (3) batches of each class of concrete shall be made using materials typical of the proposed supply and under full scale production conditions.

The workability of each of the trial batches shall be determined and three (3) cubes made from each batch for testing at 28 days. A further three (3) cubes made from each batch may be made for tests at an earlier age if required.

The trial mix proportions shall be approved if the average compressive strength of the nine (9) cubes tested at 28 days exceeds the specified characteristic strength by 3 Newton's per square millimeter, or if nine tests at an earlier age indicate that it is likely to be exceeded by this amount.

To demonstrate that the maximum free water/cement ratio is not exceeded, two batches of concrete shall be made in a laboratory with cement and surface-dry aggregate known from past records of the supplier of the material to be typical. The proposed mix proportions will not be accepted unless both batches have the cement content specified and free water/cement ratio below the maximum specified in Table 3.1.

Table 3-1: Classes of Concrete

Class	Characteristic Compressive Strength N/m ²	Maximum Free Water/ Cement Ratio	Minimum Cement Content kg/m ³	Maximum Cement Content kg/m ³	Maximum Aggregate Size mm
C25/10/A	25	0.55	360	400	10
C25/20/A	25	0.55	360	400	20
C25/20/B	25	0.55	290	400	20
C25/20/C	25	-	240	540	20
C20/20/B	20	0.55	290	400	20

C20/40/B	20	0.55	260	400	40
C20/40/C	20	-	220	540	40
C15/40/C	15	-	180	540	40
C15/20/C	15	-	180	540	20
C10/40/C	10	-	150	540	40

A, B and C denote exposure conditions for the finished concrete as defined in BS8007.

3.11 Testing of Concrete

3.11.1 General

All concrete shall be sampled and tested in accordance with the requirements of BSEN12350 and BS EN12390 unless otherwise stated in this Specification or instructed by the Engineer.

The Contractor shall allow for all the necessary labor, materials and equipment necessary for the regular sampling and testing of concrete to be placed in the Works.

3.11.2 Cement Content

Tests shall be carried out as required by the Engineer to determine the cement content of the mix. The cement content of any batch of concrete shall not be less than the specified minimum value minus 5 per cent of neither that value nor more than the specified maximum value plus 5 per cent of that value.

3.11.3 Work ability

The work ability of the concrete shall be measured as required by the Engineer by slump tests or compaction factor tests and shall be within the following limits:

Slump $\pm$ 25mm or $\pm$ one third of required value whichever is greater.

Compacting $\pm$ 0.03 Where required value is 0.90 or more

g Factor $\pm$ 0.04 where required value is 0.90 to 0.80 $\pm$ 0.05 where required value is 0.80 or less

The required value shall be that which has been accepted under Clause 3.8 of this Specification.

3.11.4 Water/Cement Ratio

The water/cement ratio shall be determined as required by the Engineer and shall not exceed the specified maximum value by more than 5 percent of that value.

3.11.5 Compressive Strength

Samples of concrete shall be taken for compressive strength at a rate of one sample per 15m³ of concrete placed or 15 batches of concrete placed whichever is the lesser volume. A greater frequency of sampling may be instructed by the Engineer until compliance with specified strength requirements has been confirmed for each class of concrete used in the Works.

Two test specimens shall be prepared from each sample and shall be cured for 28 days,
or by any other method approved by the Engineer that enables the prediction of 28-day strength at an earlier time.

On completion of curing, the two test specimens shall be tested. Provided the difference between the two results does not exceed 14 per cent of the mean of the two results, the mean shall be taken as the test result. Where the difference between the two results exceeds 14 percent of their mean, the lower of the two results shall be taken as the test result.

Compliance with the specified strength may be assumed if the conditions given in both (a) and
(b) Below are satisfied.

The average compressive strength determined from any one group of four consecutive 28-day test results exceeds the specified characteristic strength by not less than 3N/mm² for classes of concrete C20, C25 and C30 and not less than 2N/mm² for class C15 concrete.

Each individual 28-day test results are greater than the specified characteristic strength minus 3N/mm² for classes of concrete C20, C25 and C30 or 2N/mm² for class C15 concrete.

If only one test result fails to meet the second requirement then that result may be considered to represent only the particular batch of concrete from which that sample was taken provided the average strength of the group satisfies the first requirement.

If more than one result in a group fails to meet the second requirement or if the average strength of any group of four consecutive test results fails to meet the first requirement, then all the concrete in all the batches represented by all such results shall be deemed not to comply with the strength requirements. For the purposes of this Clause, the batches of concrete represented by a group of four consecutive test results shall include the batches from which samples were taken to make the first and the last tests in the group of four, together with all the intervening batches.

3.12 Failure to Comply with Specified Requirements

Failure of concrete to comply with the specified requirements will result in it being classified as defective work. Immediately on notification by the Engineer that concrete work is defective; the Contractor shall take all measures necessary to improve concrete quality before further concrete is placed in the Works. If required by the Engineer, the rate of sampling of concrete shall be increased until adequate control is again established. Tests shall be carried out on the defective concrete or test cores taken from it to establish its in-situ strength. If the results of the test satisfy the Engineer that the defective concrete will fulfil its design function then it may be accepted. If not, the Contractor shall propose strengthening or remedial work where possible or shall remove the defective concrete from the Works.

3.13 Concrete Returns and Records

The Contractor shall send weekly to the Engineer a return showing the quantities of cement and the number of mixing for each class of concrete used in each section of the Works.

Records shall be kept by the Contractor of the positions in the Work so far as batches of concrete, of their class and of all test cubes or other specimens taken from them. Copies of these records shall be supplied to the Engineer.

3.14 Equipment and Construction Procedure

The design, layout, installation and operation of equipment for processing, handling, transporting, storing and proportioning concrete ingredients and for mixing, transporting and placing concrete shall be to the satisfaction of the Engineer. Before the equipment is ordered or delivered to site, the Contractor shall submit to the Engineer drawings showing the proposed arrangements of the equipment together with detailed descriptions of the equipment proposed.

3.15 Batching

The aggregates and cement shall be proportioned by means of efficient weigh batching machines except when the Engineer has approved the use of volume batching. The machines shall be carefully maintained and cleaned and they shall be provided with simple and convenient means of checking the accuracy of the weighing mechanism, and they shall be checked when required by the Engineer. For volume batching suitable gauge boxes shall be used.

3.16 Mixing Concrete by Machine

Where the concrete is to be mixed in machines, these shall be of the batch mixing or other approved type. The machines shall ensure that all the concreting materials including the water are thoroughly mixed together before any portion of the mixture is discharged. The mixing time shall not be less than thirty seconds per cubic foot (30sec/cft) of concrete, with a minimum of three minutes (3min) mixing time per batch. The machines must be capable of discharging their contents while running.

3.17 *Mixing Concrete by Hand*

Where it is not possible to employ machine mixing and approval has been obtained from the Engineer, concrete shall be mixed by hand as near as practicable to the site where it is to be deposited. Clean mixing bankers or platforms of sufficient area for the proper execution of the work shall be provided. These platforms if constructed of timber shall consist of planks closely jointed so as to avoid the loss of any grout or liquid from the wet concrete. The whole of the aggregate and cement shall be turned over on the banker in a dry state at least twice. The water shall then be added gradually through a rose head, after which the materials shall again be entirely turned over in a wet state at least three times.

3.18 *Preparation of Surface to Receive Concrete*

Foundations which are to receive concrete shall be properly drained and watered so that no water runs over or stands on a surface on which concrete is being placed. If required by the Engineer drains provided through or beneath concrete for the temporary conveyance of water shall afterwards be completely sealed to the Engineer's approval.

Before deposition of concrete against rock, the rock surface shall be thoroughly wetted and cleaned by the application of water, or of water and air, under pressure. No concrete shall be deposited until the surface has been cleaned and passed as satisfactory by the Engineer.

Faults or seams in the rock shall be cleaned to a depth satisfactory to the Engineer and if necessary, stemmed with cement mortar of an approved mix.

Before any steel reinforcement is embedded in the concrete any loose mill scale, loose rust and any oil, grease or other deleterious matter shall be removed. Partially set concrete which may adhere to the exposed bars during concreting operations shall likewise be removed.

3.19 *Authority to Commence Placing of Concrete*

The Contractor shall give the Engineer at least 24 hours notice of his intention to place concrete in a particular section of the Works. Before concrete is placed the Contractor

shall apply to the Engineer for approval of the cleanliness, alignment and suitability of surfaces against which the new concrete is to be placed and of the fixing of form work, reinforcement, embedded parts and the like and he shall obtain written permission from the Engineer to proceed with concreting.

The Contractor shall carefully plan his concreting operation to ensure, where possible, that these operations are completed within the normal working day.

3.20 Dimension of Concrete Pours and Programme of Placing

Unless otherwise approved by the Engineer concrete shall be cast in one operation between external faces of concrete and joints shown on the Drawings or between construction joints or both.

The Contractor shall submit and obtain the Engineer's approval to a detailed concreting programme and his proposals for the location of construction joints.

3.21 Transport and Deposition of Concrete

Concrete shall be transported and deposited in such manner as to prevent segregation, loss of materials or contamination with foreign matter. The means of transport of concrete shall be subject to the approval of the Engineer. The containers for conveying the concrete shall be thoroughly cleaned immediately after use and sides dampened before work is started or restarted to prevent cement and fine material in the first batch adhering to the sides. Adequate precautions shall be taken to protect the concrete against wetting or drying out through exposure to the weather and to prevent segregation and consolidation of the mix due to prolonged jolting of the concrete. Concrete shall be placed in its final position and fully compacted before the onset of initial set. Wherever possible, concrete shall be deposited vertically in the final position required and shall not be dropped through a greater height than 1.5m. Where necessary, bins, drop chutes, downpipes or baffles shall be provided to prevent segregation of the material. Drying out of fresh concrete before deposition shall be prevented by the provision where necessary of suitable covers. Loss of slump during transport and deposition of the concrete shall not exceed 25mm.

Concrete shall not be placed in standing or running water unless so specified. Where concrete has to be placed under water, the Contractor shall submit to the Engineer his proposals indicating the methods and equipment to be employed. The concrete shall be deposited by bottom discharging watertight containers or through funnel shaped Terries which are kept continuously full with concrete up to a level above the water and which shall have the discharging bottoms immersed in the concrete in order to reduce to a minimum the contact of the concrete with the water. Special care shall be taken to avoid segregation and additional cement of about 25% must be added.

3.22 Distribution and Spreading of Concrete

Concrete shall be placed in layers not exceeding 500mm in depth approximately parallel to the horizontal or inclined construction joint planes. These layers shall be deposited from one face to the other until the full height of the lift is reached. Each layer shall be deposited on the previous one before the latter has taken its initial set and the exposed area of fresh concrete shall be maintained to the practical minimum. In order to accomplish this timing a new layer may be started before the previous layer is completed.

The face from which placing of concrete is to commence shall be selected so that if an emergency should occur which prevents the layer being completed the vertical construction joint will be formed in a structurally acceptable position.

Concrete shall not be placed during rain sufficiently heavy or prolonged to wash mortar from coarse aggregate on the exposed sloping faces of fresh concrete unless adequate shelter is provided.

Concrete shall not be placed against any surface (including formwork, reinforcement, embedded steel work, adjacent concrete or rock) which during hot weather is not adequately dampened to prevent excessive absorption of water from the fresh concrete.

Once commenced, concreting shall be carried on as continuous operation between prearranged construction, expansion or contraction joints have only if an emergency occur and interruption is unavoidable. The Contractor shall have readily available suitable pre-fabricated form work for stop ends to form emergency vertical construction joints and, in the event of such an interruption occurring,

the concrete already placed shall be properly finished up to the top and to a horizontal or inclined surface as directed by the Engineer. In water retaining structures the Contractor shall propose methods of making the joint water tight.

Concrete shall be placed carefully so as not to displace the form work or reinforcement.

3.33 Compaction of Concrete

The Contractor shall thoroughly compact all concrete immediately after it has been placed in position. Unless otherwise authorized by the Engineer, compaction shall be accomplished with the aid of immersion vibrators as specified below, together if necessary, with rods, shovels and the like. Particular care shall be taken to fill all voids and to work the concrete against rock and existing concrete surfaces, round any reinforcement and embedded fixtures and into the corners of the form work.

If the Contractor does not wish to use immersion vibrators for any portion of the work, she shall submit his proposals for alternative vibrators or compaction equipment and shall receive the Engineer's approval to the equipment before commencing to concrete the portion concerned.

Vibrators shall be of a type and size adequate for the portion placed. Vibrators shall operate at a frequency of between 7000 and 10000 impulses per minute. The Contractor shall ensure that vibrators are operated at pressures and voltages not less than those recommended by the manufacturer in order to ensure that the comp active effort is not reduced.

A sufficient number of vibrators shall be operated to enable the entire quantity of concrete being placed to be vibrated for the necessary period and in addition stand-by vibrators shall be available for instant use at each concreting place. The length and diameter of the vibrating element of immersion vibrators shall be sufficient to penetrate through the layer of concrete being placed and re-vibrate the upper portion of the underlying layer of concrete. Only men experienced in the use of vibrators shall be employed on this type of work.

Vibration shall be continued at each point until the concrete ceases to contract, a thin layer of mortar has appeared on the surface and air bubbles have ceased to appear. The period of vibration necessary shall be determined by trial in the presence of the Engineer. Vibration shall then be continued for this period at each point before any further concrete is super imposed.

Immersion vibrators shall be inserted vertically to penetrate into the layer underneath at regular intervals, which shall not exceed the distance from the element over which vibration is visibly effective and, in any case, shall not exceed 700mm. Vibrators shall not be used to move concrete laterally and shall be withdrawn slowly to prevent the formation of voids. Vibrators shall not be applied to reinforcement or other embedded items.

3.24 Protection of Concrete

the surface until it is sufficiently hard to resist damage from this cause.

No traffic shall be allowed on any concrete surface until such time as it is hard enough to resist damage by such traffic.

Concrete placed in the Permanent Works shall not be subjected to any structural loading until it has attained at least its nominal strength.

If the Contractor desires to impose structural loads on newly placed concrete, he shall make at least three test cubes and cure them in the same conditions as the concrete they represent. These cubes shall be tested singly at suitable intervals in order to estimate the time at which the nominal strength is reached.

3.25 No Partially Set Concrete shall be used

All concrete must be placed and compacted in its final position within thirty minutes (30min) of discharge from the mixer unless otherwise approved. No partially set material shall be used in this work.

3.26 Plum Concrete

Plums shall be hard clean natural stones embedded in mass concrete during the placing of the concrete. Unless otherwise shown on the drawings, the plums shall not be larger than one third of the cross section of the concrete and should not be placed closer than 150mm to each other vertically and 100mm horizontally. The volume of plums shall unless otherwise specified, not exceed forty percent (40%) of the mass concrete volume and care shall be taken to ensure that the minimum cover over any plums is 100mm.

3.27 Concreting in Adverse Weather

No concreting will be allowed to take place in the open during storms or heavy rains. Where strong winds are likely to be experienced additional precautions to ensure protection from driving rain and dust shall also be taken.

The Engineer may withhold approval of commencement of concreting until he is satisfied that full and adequate arrangements have been made.

3.28 Concreting at Night or in the Dark

Where approval has been given to carry out concreting operations at night or in places where day light is excluded, the Contractor is to provide adequate lighting at all points where mixing, transportation and placing of concrete are in progress.

3.29 Concreting in High or Low Ambient Temperature

Where the ambient temperature exceeds thirty-two degrees Celsius (32°C), the Contractor shall take special measures in the mixing, placing and curing of concrete. The temperature of the concrete when deposited shall not exceed thirty degrees Celsius (30°C). The Contractor shall carry out all necessary special measures to ensure that the maximum concrete temperature after placing shall not exceed fifty degrees Celsius (50°C) or thirty degrees Celsius (30°C) above the concrete temperature at the time of placing, whichever is lower.

During placing suitable means shall be provided to prevent premature stiffening of the concrete placed in contact with hot surfaces.

The Contractor shall not mix and place concrete when the ambient temperature falls below three degrees Celsius (3°C).

3.30 Curing and Protection

Concrete shall be protected during the first stage of hardening from the harmful effects of sunshine, drying winds, cold, rain or running water. The Contractor shall pay particular attention to the need to protect concrete immediately after the finishing operation and prior to its final set and shall submit their proposals to achieve this protection for the Engineer's approval. Protection of concrete which has achieved its final set shall consist of one or more of the following:

- (a) A layer of sacking, canvas, hessian, straw mats or similar absorbent material or a layer of sand, kept constantly moist by spraying with water as necessary for fourteen (14) days or such periods as may be directed by the Engineer.
- (b) After thoroughly wetting, a layer of approved waterproof paper or plastic membrane kept in contact with the concrete for fourteen (14) days or such period as may be directed by the Engineer.

The use of saline water for curing purposes will not be permitted.

3.31 Steel Reinforcement

3.31.1 Materials

Unless otherwise directed or otherwise shown on the Drawings, hot rolled high yield reinforcement shall be used throughout the works.

Where required, mild steel reinforcement, medium tensile steel reinforcement and high tensile steel reinforcement shall comply with BS4449. Cold twisted steel wire for the reinforcement of concrete shall comply with BS4482.

All reinforcement shall be from an approved manufacturer and, if required by the Engineer, the Contractor shall submit a test certificate of the rolling. The Contractor shall, when requested by the Engineer, provide sample pieces 1.0m long for testing.

Tying wire shall be 1.6mm diameter soft a nailed iron wire.

Before any steel reinforcement is embedded in the concrete any loose mill scale, loose rust and any oil, grease or other deleterious matter shall be removed. Partially set concrete which may adhere to the exposed bars during concreting operations shall likewise be removed.

3.31.2 Fabricating Reinforcement

hooks, bends, and the like, unless otherwise shown on the Drawings, shall be to BS 4666. The Contractor shall satisfy himself as to the accuracy of any bar bending schedules supplied and shall provide all reinforcement in accordance with the Drawing. Bar reinforcement shall be bundled and each bundle of steel shall be tagged with identifying tags, showing the size and mark of the bar. The bundles shall be stacked clear of the ground in easily accessible positions that do not in any way hinder the progress of work and shall be kept clean.

3.31.3 Fixing Reinforcement

When placed in the work reinforcement shall be free from coatings or dirt, detrimental scale, paint, oil or other foreign substances. When steel has on its surface rust, loose scale and dust which is easily removable, it may be cleaned by a method approved by the Engineer.

All reinforcing bars, ties, links and fabric shall be fixed in the positions shown on the Drawings within the tolerances specified in BS 8666. In no case shall the cover specified on the Drawings be increased by more than 5mm.

Displacement of reinforcement beyond the specified tolerance shall be prevented by supporting the bars sufficiently and securely fixing them together at inter sections where necessary.

The ends of all tying wires shall be turned into the body of the concrete and not allowed to project towards the surfaces of the concrete.

Spacers shall be used to maintain the cover to all steel and shall be made of dense cement mortar of one-part cement and two parts sand.

Spacers shall be triangular in section and only one acute edge shall bear against the form work; the flat side shall be against the steel. Wire cast into the blocks to fix them to the reinforcement shall be 1.6mm diameter soft-tempered iron. Spacers shall not be used on the wet face of water retaining or water excluding structures. Chairs, stools, etc. shall be used to maintain clearance between two or more layers of reinforcement.

Nothing shall be allowed to interfere with the specified position of reinforcement. The fixing of reinforcement shall be checked before and during concreting, and particular attention shall be given to the position of top steel in cantilever sections. During concrete placing a competent steel fixer shall be in attendance to adjust and correct the position of any reinforcement which may be displaced.

3.31.4 Splicing and Lapping

All reinforcement shall be provided in full lengths as indicated on the Drawings or bending schedules. Splicing of bars, except where shown on the Drawings, shall not be permitted without the written approval of the Engineer. Splices shall be staggered as far as possible. Bar reinforcement shall not be welded without the Engineer's written permission.

In lapped splices, the bars shall be placed in contact and wired together in such manner as to maintain a clearance between bars of not less than 50mm.

Mesh or bar reinforcement shall overlap sufficiently to maintain a uniform strength and shall be securely fastened at ends and edges. The edge lap shall not be less than 40 diameters of the mesh reinforcement bar or two mesh widths whichever is greater.

3.32 Cover to Reinforcement

The concrete cover to reinforcement shall be 50mm unless otherwise shown on the Drawings.

The Contractor shall provide any necessary concrete pads for ensuring the cover is attained and in no case shall timber packing be used.

3.33 Formwork

3.33.1 Definitions

Forms, formwork or shuttering shall mean all temporary moulds forming the concrete to the required shape together with any special lining that may be required to produce the concrete finish specified.

Falsework or centering shall mean the furnishing, placing and removal of all temporary construction such as framing, props and struts required for the support of forms.

3.33.2 Materials

The formwork may be of seasoned, planed, tongued and grooved timber, plywood, and block board, tempered hard board, steel or as specified on the Drawings.

All timber used for formwork shall be sound wood, well-seasoned and free from loose knots, shakes, large checks, warping and other defects. Before use on the work, it shall be properly stacked and protected from injury from any source. Any timber which becomes badly warped or cracked, prior to the placing of concrete shall be rejected. All form work for outside surfaces before final ground level shall be either tongued and grooved or provided with a suitable lining to produce a smooth surface finish.

3.33.3 Forms

All forms shall be of wood or metal and shall be built grout-tight and of sufficient rigidity to prevent distortion due to the pressure of the concrete and other loads incidental to the construction operations. Forms shall be constructed and maintained so as to prevent warping and the openings of joints due to shrinkage of the timber.

The forms shall be substantial and unyielding and shall be so designed that the finished concrete will conform to the proper dimensions and contours. The design of the forms shall take into account the effect of vibration of concrete as it is placed.

All formwork shall, unless otherwise directed, be provided with 25mm by 25mm angle fillets (chamfers) so as to form planes on internal and external angles.

A grout check formed from 25mm square hard wood timber shall be incorporated in the form work to provide a clean, level, horizontal joint on exposed concrete surfaces at the top of each lift.

All joints in the form work shall be either horizontal or vertical. End form work shall be square across the mass of concrete.

Where concrete is to be deposited to a slope steeper than 20 degrees to the horizontal, top form work shall be used to enable the concrete to be properly compacted unless the Engineer agrees otherwise.

Openings for the inspection and cleaning of the inside of form work for walls, piers and columns shall be formed in such a way that they can be closed conveniently before commencing to place concrete.

Form clamps, tie bolts and anchors shall be used to fasten forms. The use of wire ties to hold forms in position during placing of concrete will not be permitted. Tie bolts and clamps shall be positive in action and of sufficient strength and number to prevent spreading or springing of the forms. They shall be of such type that no metal part shall be left within the specified concrete cover. For water retaining sections, methods of fixing the forms which result in holes through the concrete section when the form work is removed shall not be used and built-in wall ties shall be fitted with water baffles.

All forms for outside surfaces shall be constructed with stiff wales at right angles to the stud and form clamps shall extend through and fasten such wales.

The shape, strength, rigidity, grout tightness and surface smoothness of forms which are re-used shall be maintained at all times. Any warped, bulged or otherwise damaged timber shall be replaced. Forms which are unsatisfactory shall not be re-used. If the surface finish on the formed concrete deteriorates as a result of deterioration of the faces of the forms, the Engineer shall instruct that forms be re-surfaced, or discarded.

All forms shall be treated with approved mould or similar oil or be soaked with water immediately before placing concrete to prevent adherence of concrete. Any materials which adhere to or discolour concrete shall not be used.

All forms shall be set and maintained true to the line designated until the concrete is sufficiently hardened. Forms shall remain in place for periods which shall be specified in Clause 3.26. When forms appear to be unsatisfactory in anyway, either before or during the placing of concrete, the Engineer shall order the work stopped until the defects have been corrected.

All formwork shall be approved by the Engineer before concrete is placed within it. The Contractors shall, if required by the Engineer, provide copies of calculations of the

strength and stability of the form work and falsework. Notwithstanding the Engineer's approval of these calculations, the Contractor shall be held responsible for the safety and adequacy of form work.

3.33.4 Falsework and Centering

Detailed plans for a false work or centering shall be supplied by the Contractor to the Engineer at least 14 days in advance of the time the Contractor begins construction of the false work.

Notwithstanding the approval of the Engineer of any designs for falsework submitted by the Contractor, the Contractor shall be solely responsible for the strength, safety and adequacy of the false work or centering.

All falsework shall be designed and constructed to provide the necessary rigidity and to support the loads from the weight of green concrete and shuttering and incidental construction loads.

Falsework or centering shall be founded upon a solid footing safe against undermining and protected from softening. Falsework which cannot be founded on satisfactory footings shall be supported on piling which shall be spaced, driven and removed in a manner approved by the Engineer. The engineer may require the Contractor to employ screw jacks, or hard wood wedges to take up any settlement in the formwork either before or during the placing of concrete.

False work shall be set to give the finished structure the required grade and camber shown on the Drawings.

3.33.5 Forms for Joints

Where permanent or temporary joints are to be made in horizontal or inclined members, stout stopping off boards shall be securely fixed across the mould to form a water-tight joint. The form of the permanent joint shall be as shown on the Drawings.

Where reinforcement or water stop passes through the face of a joint the stopping off board shall be drilled so that the bars or water stop can pass through, or the board shall be made in sections with a half round indentation in the joint faces for each bar so that when placed the board is neat and accurate fit and no grout leaks from the concrete through the bar holes, joints or around the water stop.

3.33.6 Release Agents

Only approved chemical release agents, mould creams (emulsions of water in oil) or oils containing a proportion of surfactant not exceeding 2 percent will be permitted. Water soluble emulsions and oils without surfactant shall not be used. Oil based release agents shall be applied at a rate of 7 square meters per litre one day in advance of

concreting, preferably by spray or roller. Chemical release agents shall be applied in accordance with the manufacturer's recommendations.

New timber face work shall be given three coats of release agent before use on the work to ensure uniformity of porosity on the surface.

On no account shall the release agent come in to contact with the reinforcement.

3.34 Removal of Formwork

Form work shall be carefully removed without shock or disturbance to the concrete. No form work shall be removed until the concrete has gained sufficient strength to withstand safely any stresses to which it may thereby be subjected.

The minimum periods which shall elapse between completion of placing concrete and removal of forms are given in the following Table 3.2, and apply to ambient temperatures higher than 10°C. At lower temperatures or if cements other than ordinary Portland are involved, the Engineer may instruct longer periods.

Compliance with these requirements shall not relieve the Contract or of his obligation to delay removal of form work until such removal can be completed without damage to the concrete.

Table3-2: Form work Striking Time

Position of form work	Striking Time
Beam sides, walls and columns	1to2day
Slabs of fits-props remain undisturbed	4days
Beams of fits-props remain undisturbed	7days
Removal of slab props	14days
Removal of beam props	21days

3.35 Surface Finishes

After removal of the formwork no treatment of any kind other than that required for curing the concrete shall be applied to the concrete faces until after inspection by the Engineer. All honeycombed areas, deformed surfaces or other defective surfaces shall then be repaired at the direction of the Engineer. Immediately following the Engineer's inspection of surface finish, all tie bolt cavities shall be filled with sand cement mortar and the surface left smooth, sound, even and uniform in colour.

Should the finishes surface either as-stuck or after repair exhibit a non-uniform color or texture, the Engineer shall have the right to order that the surface be given a Kim coat and then painted.

3.35.1 Formed Surfaces

All joints between panels shall be vertical and horizontal unless otherwise directed. Suitable joints shall be provided between sheets to maintain accurate alignment in the plane of the sheets.

For warped surfaces, facings shall be built upon fulminated splines cut to make a tight surface which shall then be dressed and sanded to the required curvature.

Type F1: This finish is for surfaces against which backfill or further concrete will be

placed. Formwork shall consist of sawn boards, sheet metal or any other suitable material which will prevent the loss of grout when the concrete is being placed.

TypeF2: This finish is for surfaces which are permanently exposed to view but where the highest standard of finish is not required. Forms to provide a Type F2 finish shall be faced with wrought thicknesses tongued and grooved boards with square edges arranged in a uniform pattern and close jointed or with suitable sheet material. The thickness of boards or sheets shall be such that there shall be no visible deflection under the pressure exerted by the concrete placed against them. Joints between boards or panels shall be horizontal and vertical unless otherwise directed. This finish shall be such as to require no general filling of surface pitting, but fins, surface discoloration and other minor defects shall be remedied by methods agreed by the Engineer.

TypeF3: This finish is for surfaces which will be in contact with water flowing at high velocity and for surfaces permanently exposed to view where good appearance and alignment are of importance. To achieve this finish, which shall be free of board marks, the form work shall be faced with plywood complying with BS1088 or equivalent material in large sheets. The sheets shall be arranged in an approved, uniform pattern. Wherever possible, joints between sheets shall be arranged to coincide with architectural features or changes in direction of the surface. Suitable joints shall be provided between sheets to maintain accurate alignment in the place of the sheets. Un-faced wrought boarding or standard steel panels will not be permitted for Type F3 finish. The Contractor shall ensure that the surface is protected from rust marks, spillages and stains of all kinds.

TypeF4: This finish is similar to that required for type F3 but is used in places where a first-class alignment and a dense surface free from air holes and other defects is required, suitable for the application of decorative finishes, in very high velocity water channels and in other similar circumstances.

3.35.2 Unformed Surfaces

TypeU1: This is screed finish for surfaces of roads of foundations, beds, slabs, and structural members to be covered by back fill, sub sequent stages of construction, bonded concrete topping or cement mortar beds to receive paving's, and on exposed surfaces of paving where a superior finish is not required. It is also the first stage of Type U2 and U3 finishes. The finishing operations shall consist of levelling and screeding the concrete to produce a uniform, plane or ridged surface, surplus concrete being struck off by a straight edge immediately after compaction.

TypeU2: This is a floated finish for exposed surfaces where a hard-smooth steel troweled surface is not required. Floating shall be done only after the concrete has hardened sufficiently and maybe by hand or machine. Care should be taken that the concrete is worked no more than is necessary to produce a uniform surface free from float marks.

TypeU3: This is a hard-smooth steel troweled finish for surfaces exposed to water flowing at high velocity. Troweling shall not commence until the moisture film has disappeared and the concrete has hardened sufficiently to prevent excess laitance from being worked to the surface. The surface shall be troweled under firm pressure and left free from trowel marks.

TypeU4: This finish is similar toTypeU3finish but the permissible tolerances are smaller.

3.34.3 Surface Tolerances

All parts of concrete surfaces shall be in the positions shown on the Drawings within the tolerances set out in Table3.3 or Table3.4.

In cases where the Drawings call for tolerances other than those given in Table3.3 or Table3.4, the Drawings shall rule.

Where precast units have been set to a specified tolerance, further adjustments shall be made as necessary to provide a satisfactory straight or curved line. When the Engineer has approved the alignment, the Contractor shall fix the units so that there is no possibility of further movement.

Table3-3: Surface Tolerance for Formed Surfaces

Type of	Tolerance in mm (SeeNote1)		
	A	B	C
FI	10	10	+25to-10
F2	5	10	+15to-15
F3	2	5	+10to-10
F4	See Note 2	2	+5to-5

Note1:

The tolerances, A, B and C given in the table are defined as follows:

- A** - is an abrupt irregularity in the surface due to misaligned formwork or defects in the face of the formwork.
- B** - is a gradual deviation from a plane surface as indicated by a straight edge 3 meters long. In the case of curved surfaces, the straight edge shall be replaced by a correctly shaped template.

- C** - is the amount by which the whole or part of a concrete face is displaced from the correct position shown on the Drawings.

Note2:

Abrupt irregularities are not permitted in a Type F4 finish. Any residual irregularities which remain after removal of formwork shall be removed by grinding to achieve a transition of 1 in50betweenthesurfacesadjacenttotheirirregularity.

Table3-4: Surface Tolerances for Unformed Surfaces

Type of	Tolerance in mm(SeeNote1)		
	D	E	F
U1	-	10	+20to-10
U2	Nil	10	+20to-10
U3	Nil	5	+12.5to-7.5
U4	Nil	2	+6to-4

Notes:

- D** Is the maximum allowable value of any sudden change of level in the surface?
- E** Is the maximum allowable value of any gradual irregularity of the surface, as indicated by the gap between the surface and a 3m long straight edge or correctly shaped template placed on the surface?
- F** Is the maximum allowable value of the difference in level or position between a straight edge or correctly shaped template placed on the surface and the specified level or position of that surface?

3.36 Conduits, Box-outs and Apertures

The layout of conduits, box-outs, grooves, apertures and the like shall be as shown on the Drawings or as directed by the Engineer, and shall be subject to inspection and approval by the Engineer before commencing concreting.

Conduits shall be placed as near the centers of members as possible and sufficient space shall be provided between adjacent conduits to prevent difficulties in the placing of concrete.

Box-outs, holes, grooves, apertures and the like shall be accurately set out in the form work prior to placing the concrete. Fixing blocks, ends of brackets, bolts and, where

possible, built in parts shall be cast into the concrete at the time of placing. No part of the concrete works shall be cut out for any such item, or for any other reason, without the Engineer's permission.

The Contractor shall ensure that all sub-contractors are informed of his programme for the structural works at the commencement of the Contract and that such subcontractor's requirements relating to concrete members are approved well in advance. The Contractor shall obtain from all such sub-contractors' complete information of their requirements regarding conduits, pipes, fixing blocks, ducts, holes and any other items to be cast into or formed in the concrete members. Failure of a sub-contractor to subcontract or supply such information shall not be allowed to delay the progress of the Works.

3.37 Construction joints

Concreting shall be carried out continuously up to construction joints, the position and arrangement of which shall be as indicated on the Drawings or as previously approved by the Engineer. The Contractor is to allow for working beyond the ordinary working hours where necessary in order that each section of concrete may be completed without any lapse while the work is in hand. All construction joints are to be formed square to the work.

Where vertical construction joints are required, the joint face of the first stage concrete shall be finished against a stopping-off board, or vertical end shutter, suitably notched to pass the reinforcement. When the concrete is hard and the shutter is removed, the whole joint surface shall be thoroughly hacked and roughened or scabbled with suitable tools so that no smooth skin of concrete is visible and that all aggregates and solid matrix around them is exposed.

For horizontal or slightly inclined construction joints, the surfaces shall preferably be prepared when the concrete has set but not hardened by jetting with a fine spray of water and brushing with a stiff brush to remove the smooth skin and expose the aggregate without disturbing it. Where this treatment is impractical and work is resumed after the concrete surface has hardened, a similar procedure shall be adopted as on vertical joints.

If, in the opinion of the Engineer, any deleterious material has come into contact with the concrete of the construction joint or if the concrete is honeycombed or unsound for any reason, the concrete shall be cut back to such a depth as the Engineer shall order and the roughened surfaces shall be thoroughly cleaned by compressed air and water jets or other approved means.

Immediately before concreting is resumed, the roughened joint surface shall be thoroughly cleaned with compressed air and water jets and slightly wetted and cement grout placed. The Contractor shall take precaution to avoid segregation of the concrete along the joint plane and to obtain thorough compaction.

3.38 Movement joints

Movement joints shall be formed in the position and manner shown on the contract Drawings or instructed by the Engineer. In the case of water retaining structures, joints shall be made water-tight by the provision of a continuous water stop, with suitable water-resistant filler material and sealant. The materials and workmanship utilized in movement joints shall comply with the following:

- (a) Compressible filler shall be self-expanding cork filler consisting of cork granules bonded together with an insoluble, synthetic resin. When subject to wet or moist conditions the filler shall be capable of swelling to occupy a larger volume than that

of the material supplied. The expansion properties of the filler shall not be less than one hundred and forty percent (140%) when immersed in boiling water for one hour (1hr). The filler shall be supplied and stored in sealed moisture resistant wrappings. Compressible filler shall be secured to the first cast concrete surface using an approved adhesive.

- (b) Water stops, either centrally or externally placed, shall be Polyvinylchloride (PVC) of the dimensions and type shown on the Drawings. PVC water stops shall have an elongation of at least 300% at rupture with a tensile strength of more than 12.3N/mm². Gluing temperature shall be about 150°C. The PVC water stop shall accommodate a transverse movement of at least 50mm. For expansion joints the water stops shall incorporate a center bulb or box to allow movement to be accommodated. Centrally placed water stops shall have reinforced eye lets on the outer flange to facilitate the positioning of the water stops by wiring to the surrounded steel work. Externally placed water stops shall include a wide reinforced nailing flange for positive fixing to formwork or adjacent concrete faces. Water stop shall be firmly supported by split stop-end shuttering where appropriate, and in no case shall the water stops be pierced to assist in fixing. Special care should be taken to ensure that the concrete is well worked against the embedded part of the water stops and is free from honeycombing. Precautions shall be taken to protect any projecting portions of the water stops from damage during the progress of the work and from sunlight and heat. Where water stops are required to be jointed, this shall be undertaken using approved heat welding equipment. The water stops shall be installed in accordance with the manufacturer's instructions and to the approval of the Engineer.
- (c) Joint sealant shall be bitumen-rubber sealing compounds and shall be pourable and in accordance with BS2499 for horizontal joints and shall be an approved solvent type gun grade applied by suitable for vertical joints.
- (d) Miscellaneous materials necessary for the installation of movement joints such as adhesives for securing filler materials, bond breaking tapes, bituminous paints for creating a discontinuity between concrete surfaces and primers shall be compatible with the compressible filler, water stops and sealant specified previously.

Contraction joints where specified shall be formed in the position and manner shown on the Drawings. The reinforcement shall be discontinuous across the joint. Dowel bars, water stops and sealant shall be provided as shown. The face of the first stage concrete shall be finished fair faced and after curing painted with two coats of bituminous paint. Casting of water stops and sealing of joints is to be carried out in accordance with the manufacturer's instructions.

Dowel bars shall be round mild steel of the dimensions shown on the Drawings. The bars shall be cast into the first stage concrete and the protruding part shall be painted with two coats of bituminous paint.

Expansion joints where specified shall be formed in the position and manner shown on the Drawings. The reinforcement shall be discontinuous across the joint. Dowel bars, water stops, compressible filler and sealant shall be provided as shown. The face of the first stage concrete shall be finished fair faced and after curing the compressible filler shall be fixed in position in a manner to the approval of the Engineer. Casting in of water stops and sealing of joints is to be carried out in accordance with the manufacturer's instructions. Dowel bars shall be round mild steel of the dimensions shown on the drawings. The bars shall be cast into the first stage concrete and the protruding part shall be painted with two coats of bituminous paint. An endcap shall be fixed to the end of each bar prior to pouring the second stage concrete, in order to create avoid at the end of the bar to accommodate any movement.

3.39 Precast Concrete Units

Precast concrete units shall be provided by an approved specialist supplier or may, subject to the Engineer's written approval, be manufactured by the Contractor. The Engineer may require the Contractor to supply samples of precast concrete units for testing prior to the approval of the proposed supply for each type of unit and such samples shall be supplied and tested as directed by the Engineer.

Precast concrete units shall be made in accordance with the provisions of this Specification covering concrete work. Precast concrete units shall be manufactured under shed roofs and protected from the weather. The units shall remain in the molds for seven days and shall remain protected for a further seven days, during which periods the concrete shall be shielded by sacking or other approved material which shall be kept wet. The units shall then be moved from the sheds and stacked in the open for at least a further seven days to season before being set in position.

Precast concrete work shall be tested as directed by the Engineer and work failing to meet the requirements of the Specification shall be rejected. Precast units that become damaged during handling shall likewise be rejected.

The Contractor shall, when required, make arrangements with his supplier for access to the supplier's work for the Engineer to inspect and carry out tests on precast concrete units.

All precast concrete units shall be marked with individual identification. Lifting hooks are to be attached only to those positions shown on the Drawings or detailed by the Engineer. The Contractor shall be deemed to have included in their rates for all measures required to handle and stack units safely and without undue stressing.

3.40 Breaking out Existing Concrete or Blockwork

Well in advance of the commencement of the work the Contractor shall seek the approval of the Engineer regarding the proposed method of breaking out existing concrete or blockwork in the positions shown on the Drawings or as directed by the Engineer.

3.41 Cement Grout

Cement grout for general purposes shall consist of Portland cement and water mixed in the proportion of one (1) part by volume of cement and one and a half (1.5) parts by volume of water. The grout shall be used within one hour (1hr) of mixing.

3.42 Cement Mortar

Cement mortar shall be machine mixed and unless otherwise specified, consist of three (3) parts of sand to one (1) part of Ordinary Portland cement mixed and thoroughly incorporated together. Just enough water will be added to give a work ability appropriate to its use. The above proportions are by volume. Mortar shall be used whilst freshly mixed and no softening or re-tempering will be allowed.

3.43 Concrete Block and Bricks Masonry

Concrete blocks and bricks shall comply with BS6073: Part1 and shall have a minimum 28 days' compressive strength of 3.5N/mm² and 7N/mm² respectively. The concrete blocks and bricks shall be laid in a staggered pattern such that the vertical joints between two consecutive layers are offset by half a block length. Joints on the inside faces shall be

Rendered in which case the joints shall be raked out at a depth of 5mm. Rendering shall consist of 1:2 mortar applied to a thickness so as to ensure professional finish

The mix used to manufacture concrete blocks shall not be leaner than 1:9 by volume and the maximum size of aggregate shall be 10 mm. The standard size of the concrete block shall be 400mm x 200 x 200 mm and 300 x 100 x 100 for bricks. However, blocks and bricks of other sizes may be used if approved by the Engineer for proper bonding at corners and openings

The concrete blocks and bricks shall be wetted before laying and shall be set in mortar, which complies with the specifications given in Clause 3.42. Unless otherwise stated, the maximum joint thickness shall be 12mm and the horizontal and vertical joints shall be filled with mortar. Joints shall be finished flush with the face of the blocks and bricks. The Concrete block and brick masonry shall be cured for a period of seven days by covering the work with two layers of hessian, which is kept permanently saturated. Provision shall be made to clean all exposed faces both as the work proceeds and on completion so that they are left in a neat, tidy and clean condition.

Building masonry will not be permitted in heavy rain without the approval of the Engineer. In such instances the Contractor shall make provision to protect materials and the newly placed mortar from the rain.

Concrete blocks shall either be obtained from an approved manufacture or made on site in approved block making machines. When casting of the concrete blocks is done at site, these shall be removed from the casting machine and deposited on edge on covered racks and left for 3days, during which time they shall be kept constantly wet. Afterwards they may be placed on racks in the open provided they are protected by hessian cloth or similar and kept wet for a further 5days. Thereafter they shall not be moved or used in the works until they are 28days old.

Chambers shall be constructed after pipes have been laid, except the bases maybe constructed earlier to avoid deterioration of the formation.

Back filling around completed chambers shall be with suitable material deposited equally all round and compacted in accordance with the Specifications.

Where any pipes are built in to concrete or block work the pipe shall be surrounded in two layers of polythene sheet in gun less a puddle flange has been shown on the Drawings.

3.44 Rendering Work

3.44.1 Material

Cement, water and fine aggregate shall conform to the requirements specified in the concrete works. Mesh reinforcement shall be plain diamond expanded steel at hinge to BS1369 where specified. Lime shall be to BS980 and shall be mixed with water and allowed to stand prior to use according to the manufacturer's recommendations.

The mix proportion of the cement mortar by volume shall be as follows:

- For rendering coat, Cement: Sand=1:5
- For finishing coat, Cement: Sand=1:3

Lime putty may be mixed in mortar for finishing coat at 10% of sand by volume.

3.44.2 Waterproof Cement Mortar

Waterproof mortar shall be made by mixing a waterproof agent into ordinary cement mortar. The Contractor shall be responsible for selection and quality of the waterproof agent and this shall be approved by the Engineer before use. The mixing and application shall be in accordance with the manufacturer's instructions.

3.44.3 Application

The surface which is to receive a rendering coat shall be free from all laitance, scum, loose carbonate scale, loose aggregate dirt and other foreign matters. Concrete block, brick or stone surfaces shall be sufficiently and uniformly damped immediately before application of mortar. Concrete surfaces shall be kept thoroughly wet for 24 hours prior to the application of mortar.

Where shown on the drawings or directed by the Engineer, steel wire lath shall be fixed to the brick, concrete block or concrete walls before applying cement mortar plaster.

Cement mortar shall be used within 30 minutes from the time of mixing. Re-tempering shall not be permitted.

The total thickness of rendering plus finishing coat shall be 30mm for the floors and 20mm for wall. Cement mortar finish shall be trowel finished unless otherwise specified. When the finishing coat is applied, the entire surface of floor or wall shall be finished in one operation in order to minimize joint marks.

When expansion and control joints exist in the base structure, provision shall be made to prevent cracking of the mortar by inserting metal expansion beads within the coating thickness in a manner approved by the Engineer.
where otherwise specified without any bulging, runs, bruises or stains.

After application of the finishing coat, the surfaces shall be kept continuously damp for not less than 48 hours and then allowed to become thoroughly dry. Moistening shall be started as soon as the surface has hardened sufficiently not to cause displacement or damage.

3.45 In Situ Concrete Chambers

In situ concrete chambers shall be constructed generally in accordance with Section 3 of this Specification.

3.46 Chamber Covers and Slabs

Covers and slabs shall be the type; size and weight shown in the drawings. Care shall be taken to see that the slabs are even so that the cover can seat without rocking.

Covers and frames shall be provided as shown on the drawings. The top surface of the covers shall be flush at all points with the surrounding surface of paved areas or as directed in unpaved areas. Any slight adjustment of the slab level which may be necessary to accomplish this shall be effected by topping the sidewalks with concrete.

4. STONEWORK

4.1 Stones

Stone for all purposes shall be the best of its kind, sound and durable, free from flaws and from soft, weathered or decomposed parts. The stone and the quarry from which it is obtained shall be subject to the approval of the Engineer, samples shall be submitted by the Contractor of the stone he proposes to use in the Works and the Engineer's approval shall be obtained before such stone is used or any order is placed.

The stone used shall be clean and must be washed if deemed necessary in the opinion of the Engineer.

Stones for face work shall be as far as possible quarry split and not bull nosed or hammer-dressed. A moderate amount of dressing to trim off large projections will however be permitted. Exposed faces of stones for masonry shall be free from tool marks except such as are inherent in the nature of any dressing that may be specified. In rock-faced work the roughness on the surface shall not project more than 40mm for stone less than 0.3m² face area and not more than 60mm for large stones.

4.2 Stone Masonry

Masonry shall be built to the lines and levels shown on the Drawings.

2

a uniformly random appearance and shall be selected in laying so as to present an even distribution of large and small stones on the face.

For the arises, stones shall be roughly squared, quarry split and of a size to give out bands varying from 300mm to 500mm in length and in bands from 150mm to 250mm. The alignment of arises shall be set true to the required lines.

The stones shall be set in mortar with their natural bedding plane (if any) as near normal as possible to the face or normal to the line of thrust in the case of load bearing structures. Particular care must be given to obtaining a sound bond both longitudinally and transversely and there shall be at least one bond, or length not less than two thirds of the wall thickness, in each square yard of wall face.

The mortar, unless otherwise specified, shall be machine mixed cement and sand in the proportion of one part to three (1:3) parts generally as described in the specification. Mortar shall completely fill all interstices between the stones.

The face joints in rubble masonry may vary in thickness from 10mm to 20mm. They shall be finished as a neat weathered joint with mortar while the work proceeds where the masonry is specified to be "un-pointed". Where pointing is specified, the joints in each day's work shall be raked out to a depth of not less than 25mm before the mortar has set. Subsequently the joint shall be filled with mortar and finished in accordance with Clause 4.6. The face of the masonry is to be kept wet while the pointing is proceeding. Provision shall be made to clean all exposed faces both as work proceeds and on completion so that they are left in a neat, tidy and clean condition.

Building of masonry will not be allowed in heavy rain without the written consent of the Engineer. Building shall only proceed when suitable precautions to the satisfaction of the Engineer shall be taken against the action of rain on newly placed mortar. If for any reason of urgency, the consent of the Engineer should be desired to a departure

from these provisions, the Contractor shall submit to the Engineer for approval their proposals for protecting the materials and work from the weather.

4.3 Types of Masonry

The arrangement of the stones on the exposed face or faces of the masonry shall be as described below according to which type is called for on the Drawings.

Random rubble un-coursed masonry shall be built with stones of irregular shapes taken generally as they come from the quarry, preparation being limited to the removal of inconvenient corners and excrescences. They shall be selected as the work proceeds to give a uniformly random appearance and no attempt shall be made to form courses.

Random rubble masonry brought to courses shall be generally as the preceding type except that it shall be levelled up to courses between 300mm to 400mm in depth and coinciding with the quo in stones.

in depth of stones squared to rectangular shapes and selected so that all stones in one course are of approximately the same height.

4.4 Bedding of Stone Masonry

Unless otherwise directed by the Engineer, all masonry stones, when incorporated in the Works shall be laid on its natural bed, except in the case of arches where the natural bed shall be radial.

4.5 Special Stonework

Special stonework shall consist of approved stones dressed to the shapes and dimensions and with the faces tooled, all as shown on the Drawings. All stones shall be laid true to line and centre with mortar joints as shown on the Drawings.

4.6 Pointing of Joints in Masonry

Unless otherwise shown on the Drawings, pointing to masonry joints shall be flush and shall be formed by raking the joint clean and then filling it with pointing consistency mortar which shall be given a flush face with a steel trowel.

4.7 Hand Placed Rubble Filling

Hand placed rubble filling shall consist of stones individually selected and placed by hand firmly in place in bearing contact with each other or with the sides of the space to be filled; the voids shall be carefully filled with small rocks and spalls wedged together to form a compact mass. The sides of stones shall be roughly trimmed if necessary, with a spalling hammer to obtain a reasonably close fit. On the exposed face the stones shall be placed with their flattened sides upper most and in the plane of the face.

4.8 Tipped Rock/Pitching

Rock protection on embankment slopes and around structures shall be to the lines and levels shown on the contract Drawings. The terms "tipped rock" and "pitching" refer to the manner in which the rock is placed.

The different classes of rock are specified on the Drawings according to nominal size and the maximum and minimum size of the individual particles. Within the size limits of each class, the rock fragments shall be well graded with not more than forty per cent (40%) of the rocks being smaller than the stated nominal size. The shape of the rock shall be roughly uniform with no dimension less than sixty percent (60%) of the

largest dimension. The individual rock pieces shall be dense, durable and abrasion resistant.

The Contractor shall submit bulk samples of not less than 2m³ of each class of rock for approval by the Engineer prior to placing. These samples shall be retained for comparison with material being placed in order to ensure a reasonable degree of uniformity within each class.

The base on which rock protection is to be placed shall be compacted and trimmed to the lines and levels shown on the drawings. Where two or more classes of rock are specified, the lower layers shall be completed to the Engineer's approval before the placing of subsequent layers.

Tipped Rock shall be tipped directly into place and roughly trimmed to the required profile. The thickness, lines and levels of each class of tipped rock are shown on the Drawings.

Pitching will be used where a finished horizontal or inclined surface is required. It shall consist of hand placed stones, with spalls wedged into the interstices to produce an even surface, without projection above the neat lines shown on the Drawings. Care shall be taken to ensure that the stones are well bedded and the percentage of spalls shall not exceed forty percent (40%) of the total rock volume. Pitching on slopes shall be built upwards from the toe, unless otherwise directed by the Engineer. A coping consisting of large flat stones shall be laid along the top of stone pitching on slopes to produce a firm edge.

Tipped Rock and Stone Pitching shall consist of selected hard durable rock free from weathered or decomposed parts to the approval of the Engineer, containing no flaky stone and being well graded within the limits shown below. The class and the thickness of the layer shall be as shown in Table 4.1 below.

Table 4-1: Classification of stone pitching materials

F	90	35-55
	45	0
G	850	100
	500	30-60
	300	0

Tipped rock/stone pitching shall be placed in an approved manner in order to produce a uniform well-knit unsegregated layer in which all sizes are held in position.

4.9 Gabions

Gabions shall be of the types and sizes shown on the Drawings. The cages shall be constructed from mild steel wire complying with BS 1052, "Specification for mild steel wire for general engineering purposes", galvanized in accordance with BS 443, "Specification for testing zinc coatings on steel wire and for quality requirements". The wire shall be 3mm diameter formed into a fabric having a mesh of 75mm x 100mm for baskets and 60 mm x 80mm for mattresses.

Stone filling for gabions shall consist of hard durable rock, free from weathered or decomposed parts. The minimum dimensions of each stone shall not be less than half its maximum dimension. For mattresses the stone shall be 200mm to 150mm for baskets the stone shall be 300mm to 200mm. The stone shall be obtained from a source approved by the Engineer. No stone shall be smaller than the size of the gabion mesh. In carrying out the filling, selected pieces of stone of elongated shape shall be placed with their flatter and elongated faces in contact with the mesh wherever possible.

The empty gabions shall be placed to line and level as shown on the Drawings or as directed by the Engineer and then stretched so that the gabions regain their shape on being filled. Diaphragms shall be provided at no more than 1m intervals for baskets and not more than 0.6m intervals for mattresses. A gabion shall not be completely filled until the adjacent basket or mattress has been half filled, unless otherwise directed, in order not to cause displacements from bulging during filling.

For baskets at least two horizontal connection wires shall be tied between front and back of the gabion in each 1m compartment, at a height of 300mm and 600mm from the bottom as the stone fill reaches these levels. Additional tie wires shall be provided if necessary and in no case shall the gabion basket bulge by more than 40mm. Where a continuous line of gabions is required, adjacent gabions shall be securely tied together at the top and bottom of the gabions with tying wire.

The gabions shall be filled to a level just sufficient to require the lid to be forced into place with a bar. The lid and all joints between baskets and between diaphragms and baskets shall each be tied down with a continuous running wire.

Where gabions are to be shaped, the shape shall be formed by folding the mesh internally and tying it with a continuous running wire.

All tying wire shall be galvanized and of same gauge as specified for the cages above.

The surface upon which gabions are to be laid shall be compacted to a minimum dry density of 95% of the maximum dry density (AASHTOT99).

4.10 Geo textile Filter Cloth

Geo textile filter cloth shall be made of non-woven polyester material with a minimum weight of 270g/m² and minimum thickness of 2.3mm.

The material shall be placed carefully on suitably cleared surfaces, such that tearing or piercing is avoided at all times.

Continuity at horizontal and vertical joins shall be achieved with a minimum overlap of 0.6m. Overlaps may be physically sealed using spot welds with an open flame and subject to approval of the Engineer. On a horizontal join, the new layer shall be placed on the outside and backfilling shall proceed carefully to ensure that full contact of the join overlap is maintained. On a vertical join, the new layer shall be placed on the inside, and backfilling shall proceed such that contact is first on the outside layer, thereby sealing the inside layer to prevent soil migration between the overlap.

4.11 Graded Filters

The filter shall consist of well graded natural or manufactured aggregate having the following radiation. In the following ratios, FM represents the filter material and BM the base material.

For graded filters of sub-rounded particles:

50%sizeFM

$R_{50} = \frac{50\% \text{sizeFM}}{50\% \text{sizeBM}} = 12 \text{ to } 58$

50%sizeBM

an

d 15%sizeFM

$R_{15} = \frac{15\% \text{sizeFM}}{15\% \text{sizeBM}} = 12 \text{ to } 40$

15%sizeBM

For graded filters of angular particles: 50%sizeFM

$R_{50} = \frac{\text{50\%sizeBM}}{\text{an}} = 9\text{to}30$

d

15%sizeFM

$R_{15} = \frac{\text{15\%sizeBM}}{\text{15\%sizeFM}} = 6\text{to}18$

The filter material should pass a 7mm for minimizing particle segregation and bridging during placement. Also, the filter must not have more than five per cent (5%) of material finer than that passing a 60-micron sieve to prevent movement off lines within the filter.

The graded filters shall consist of stone graded to meet the requirements indicated in Table 4.2 below.

Table 4-2: Classification of Filter material

Class	Size of stone d(mm)	Percentage by weight smaller than stone sized (%)
A	63	100
	31	70-100
	8	10-80
	2	0-25
	1.4	0
B	16	100
	4	64-100
	15	15-64
	0.009	0-025

The filter shall be placed in layers and tamped into place in such a manner that mixing between layers or between the filter material and the formation to be protected, shall not occur.

Care shall be taken to ensure that segregation of sizes does not occur. The minimum thickness of each filter layer shall be 250mm unless otherwise shown on the Drawings. Where the term "gravel backing" is used on the drawings or Bills of Quantities, this shall be taken to mean graded filter class A material.

4.12 Hardcore

Hardcore shall consist of broken rock, concrete or other approved hard material, clean and free from extraneous matter, having a maximum particle size of 100mm. It shall be spread and levelled, watered and compacted, and then blinded with a layer of fine

material of grading 3mm to dust, watered and compacted all to the Engineer's approval.

5. PIPEWORK

5.1 General

The Contractor shall construct pipelines to the lines and levels using grades, classes, or designs of pipe, bedding, and hunching and surrounding as shown on the Drawings or directed by the Engineer.

Unless otherwise described in the Contractor agreed by the Engineer only one type of pipe shall be used within any individual length.

All materials shall be subject to the approval of the Engineer prior to procurement and delivery. Upon delivery, the Engineer shall inspect the delivered material for compliance with the specifications. In case of non-conformity, the Contractor shall replace the material at his own cost.

The pipes and fittings shall comply in all respects with British Standards and jointing of pipes and fittings shall be carried out in accordance with the manufacturers' instructions and to the approval of the Engineer.

5.2 Storage and Protection of Materials

Pipes shall be stacked on affirm base using two timber packers only under the barrel of rigid pipes such as concrete.

Flexible pipes such as PVC-U shall be stacked closely side by side on affirm plane bases at the whole length of the barrel is uniformly supported and sockets are clear of the ground. Each succeeding layers' hall be placed at right angles to the previous layers. The height of any stack's hall be not more than six layers of pipes and in the case of steel, not more than two layers.

Each class and size of pipe shall be stored separately in its own stockpile. Fittings and specials of any type shall be stored in a single layer only.

Pipes and fittings shall at all times be adequately protected from damage during transport, storage and handling. Cracked or chipped pipes shall not be used in the permanent works. Steel and large diameter plastic pipes shall be fitted in the factory with end caps or reinforcement adequate to prevent distortion during transport, storage and handling.

Plastic pipes and fittings shall be protected from direct sunlight and excessive heat. Deformed pipes and fittings shall not be used in the permanent works.

All rubber rings or other materials that may deteriorate under the action of sunlight, ozone or inclement weather shall be stored in permanent shade in lockable weather proof sheds. Care shall be taken at all times to prevent contamination of rubber or plastic products or other petroleum-derived solvents.

Granular bedding shall be stored on a firm impermeable base so that it does not become contaminated with deleterious matter.

5.3 Handling Pipes and Fittings

Before any pipes are delivered to site the Contractor shall submit details to the Engineer of his proposals for handling pipes during transport, in store and during laying.

Pipes and specials shall only be transported on properly constructed or adapted vehicles containing correctly shaped and padded cradles or with strong, saw dust filled bags separating pipes and vehicle body. During transport and in store, pipes shall not rest on narrow traverse supports likely to cause damage to the pipe or its coating. Pipes shall not be unloaded from a vehicle by tipping or dropping.

Pipes, specials and fittings shall not be subjected to rough handling at any time. Under no circumstances shall they be dropped during loading or off-loading or be allowed to collide with one another. Any materials that have been dropped from a vehicle shall immediately be rejected for use on the Works. The same shall apply for any pipes found defective before laying.

The handling of any pipes exceeding 200kg mass other than by means of a crane is specifically forbidden. The Contractor shall maintain a suitable mobile crane on the Site and shall use it for all loading, unloading, transferring between vehicles and lowering into the trench of such pipes. The crane shall be fitted with a sling of ample width. Wire rope slings or hooks in the ends of pipes shall not be used for pipes or fittings of any diameter or mass.

In making arrangements for handling pipes, the Contractor shall take into account any recommendations made by the pipe manufacturer.

Where appropriate the requirements of this Clause shall apply to fittings and other components.

5.4 Cutting Pipes

The cutting of pipes for making up lengths shall be carried out by a method which leaves a clean square end.

Concrete pipes shall be cut with a concrete saw or by hand. If cut by hand the end of the pipes shall be trimmed even and square and if reinforced, the steel shall be cut flush with the face of the concrete. If instructed by the Engineer the exposed ends of the steel shall be protected with bitumen or a cement grout.

Steel pipes to be cut shall have the line to be cut clearly marked round the pipe. Cutting shall be carried out by cutting disc or by oxy-acetylene and the cut end shall subsequently be ground to the correct profile for the method of jointing in use.

5.5 Pipes and Fittings

1. Concrete Pipes

Concrete pipes shall comply with BS5911 "Specification for concrete cylindrical pipes, bends, junctions and manholes, unreinforced or reinforced with steel cages or hoops" save that the crushing test loads for the various diameters of pipe shall be as follows:

Table5-1: Pipes and Fittings

Nominal size of pipe	Works proof load kN/m effective length
300	23 (Class M equivalent)
450	35 (Class M equivalent)
600	46 (Class M equivalent)
800	54 (Class M equivalent)
900	85 (Class M equivalent)
1000	73 (Class M equivalent)
1200	110 (Class M equivalent)
1500	132 (Class M equivalent)

Works proof loads shall be 80% of the maximum loads for each size of pipe.

Damaged pipes showing signs of visible cracking either on the inside or outside surface shall not be used.

2. Steel Pipes

Steel pipes and fittings shall comply with BSEN 10224:2003 Non-alloy steel tubes and fittings for the conveyance of aqueous liquids including water for human consumption –technical delivery conditions.

Pipe shall be either seamless, electric welded or submerged arc welded. However, the manufacturing process shall not be beyond their allocated diameter ranges: **Table5-**

2: Steel Pipes

Manufacturing process	Outside diameter range, mm	Thickness range, mm
Seamless(S)	26.9–711	2.0–100
Electric Welded (EW)	26.9–610	1.4–16

Submerged Arc (SAW)	Welded	168.3-2743	2.9-50
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without a welded seam. If necessary, the hot worked tubular product may be subsequently cold finished to produce the desired shape, dimension and properties.

Electric Welded (EW) pipe formed continuously from a steel strip with a longitudinal seam. This seam is joined by electric resistance or electric induction welding where in the edges to be welded are mechanically pressed together and the heat for welding is generated by the resistance to flow of the electric current.

Submerged Welded pipe (SAW) formed from a steel strip with a longitudinal or helical (spiral) seam. The seams are then welded together by a coal essence of metals caused by heating them with an arc or arcs between a bare consumable electrode or electrodes. The arc and molten metals are shielded by a blanket of granular, fusible material on the work. Welding shall include at least one pass on the inside and one pass on the outside of the pipe.

Pipes shall not include welds used for joining lengths of steel strip together prior to forming except for helical welded pipe provided that such weld is made using the same method of welding as the helical seam.

Pipes shall not contain circumferential welds. Pipes shall not be manufactured on site.

Pipes formed from, plate, strip or coil shall have edges mechanically sheared before forming. In the case of pipes thicker than 10mm to be manufactured by the Submerged Arc Process (SAW), the edges of plate, strip or coil shall be chamfered by mechanical milling.

Pipe shall be delivered in 12m exact lengths for DN 250 and above and 6m exact lengths for DN 200 and below. The tolerances on pipe length shall be in accordance to Table 9 of BS EN10224.

Unless otherwise specified, pipe shall be supplied with spigot and socket push-fit joints with elastomeric seals. The joints shall be flexible joints as defined in BSEN805:2000 and the allowable angular deflection of the joints shall comply with the Class B limits given in Table5 of EN805.

Steel pipes and fittings larger or equal to DN200 shall be internally lined throughout their entire length internally with either:

- (a) Fusion bonded epoxy to AWWAC213(400µm dry film thickness); (b) Solvent free liquid epoxy to AWWAC210(400µm dry film thickness); (c) Polyurethane to AWWAC222 (500µm dry film thickness).

The materials and application process shall be subject to the Engineer's approval.

Steel pipes and fittings smaller or equal to DN150 may be lined in cement mortar to AWWA C205.

For steel pipes DN 500 and below, the external protection shall be fusion-bonded epoxy to AWWA C213.

Dimensions for fittings shall comply with BSEN 10224. In the case of fittings such as reducers, laterals and wash out tees not covered in BS EN 10224, the dimensions shall comply with AWWAC208.

Calculation of thickness of bends and reinforcement of tees and laterals shall comply with AWWAC208 and AWWAM11. The Contractor shall submit details of such calculations.

Flange jointed pipes shall have flanges complying with BSEN1092:2002.

All steel flanged pipes and fittings shall be supplied complete with hot dipped galvanized bolts, nuts to BS EN ISO 1461 (minimum 305g/m²) and appropriate gaskets. Gaskets shall be EPDM rubber and conform to BSEN681. They shall be suitable for potable water.

The Contractor shall make available to the Engineer the manufacturer's certificates covering the chemical analysis and physical properties of each cast of steel used in the manufacture of pipes. In addition, a product analysis shall be conducted on the steel coils, plates, billet or blanks prior to pipe manufacture.

All pipes shall be hydraulically tested before leaving the factory to induce a hoop stress equal to 70% of the minimum yield stress pressure as specified in BSEN 10224.

All pipes shall be tested according to Table 14 of BSEN10224 and at the frequency stipulated in Table 15.

All tests shall be carried at the expense of the Contractor at the place of manufacture and the Contractor shall supply a signed certificate on delivery of the goods concerned giving results of the tests and certify that the goods concerned have been manufactured in accordance with this Specification.

3. Galvanized Steel Tubes

Galvanized mild steel tubes and fittings shall comply with BS 1387 Class B or "Medium Grade". Threading for screwed and socketed joints shall be in accordance with the requirements of BS21.

Joints shall be made with an approved pipe-jointing compound in accordance with the manufacturer's instructions. Red lead compounds shall not be used. Joints in underground piping shall be coated with bitumen or other approved composition.

All underground sections of pipework to be protected against corrosion by treating with K1-60 bitumen emulsion primer, and wrapped with fibre glass and coated with two coats of bituminous tap coats all to manufacturer's specification.

The bituminous paint is to be manufactured to ASTM D1187-82.

All fittings for galvanized steel water pipework shall be galvanized heavy weight fittings in accordance with BS EN10241. All fittings shall be subject to the approval of the Engineer.

Brass or gun metal fittings shall be subject to the approval of the Engineer.

4. PVC-U Pipes

Un-plasticized Polyvinyl Chloride (PVC-U) pressure pipes shall have outside diameters, laying lengths and wall thickness complying with KS-06-149 Part 2: 2000. Joints shall be of the spigot and integral socket type. Solvent weld joints are not permitted in buried PVC-U pipelines.

Fittings for use with PVC-U pressure pipe shall be manufactured from either PVC-U or cast iron with socketed joints and shall comply with ISO 727. Cast iron fittings shall be bitumen coated. Aluminum alloy fittings are not permitted.

The metal adapts or fittings shall comply with ISO4132.

5. PE Pipes

Polyethylene (PE) pipes and fittings shall comply with ISO4427:1996.

5.6 Valves

1. Gate Valves

Gate valves shall conform to BS5153-1:2004. The valves shall be tested in accordance with BSEN1074-2:2000.

Non-return valves BS EN 1074-3:2000

Air valves BSEN1074-4:2000

Hydrants BSEN1074-6:2004

All gate valves shall close in a clockwise direction and the direction of opening and closing shall be cast on the hand wheels or valve casing with the words 'OPEN' and 'CLOSE' respectively. All gate valves shall be capable of being operated manually with a maximum applied torque of 100 Nm for valves with a nominal diameter less than 450mm. The Contractor shall ensure that the gate valves supplied are fitted with appropriate thrust bearing guides and gearing to fulfil these requirements, ensuring that when reduction gearing is employed, the gear ratio shall not exceed 4:1.

Isolating gate valves shall permit manual closing off the raw water supply.

2. Butterfly Valves

Butterfly valves shall conform to BS EN593:1998: "Industrial valves. Metallic butterfly valves." The valves shall be tested in accordance with BSEN 1074-2:2000.

The use of butterfly valves as main line valves shall not be permitted.

3. Check Valves

Check valves shall comply with BSEN 12334:2001: "Industrial valves. Cast iron check valves." The valves shall be tested in accordance with BSEN 1074-3:2000.

The valves shall be installed in a horizontal position to avoid malfunctioning of the check.

4. Single Air Valves

Single air release valves shall be of the small orifice type and shall have bodies of cast iron. The inlet shall be 25mm diameter fitted with an isolating plug cock and shall be screwed in an 80mm diameter blank flange drilled and tapped to BS 21. Single air valves shall be of pattern and manufacture approved by the Engineer for the conditions under which they will operate, and be fitted with a pressure gauge tapping and plug. Floats are to be manufactured from high-density polyethylene.

The valves shall be tested in accordance with BSEN 1074-4:2000.

5. Double Air Valves

Air release and vacuum break valves shall be of a compact, single chamber design with solid cylindrical high-density polyethylene control floats housed in a tubular stainless-steel body with stainless steel ends secured by stainless steel tie rods.

The valves shall have integral surge alleviation mechanisms that shall operate automatically to limit transient pressure rise or shock induced by closure due to high velocity air discharge or the subsequent rejoining of separated water columns. The limitation of pressure rise must be achieved by deceleration of approaching water before valve closure.

The intake/discharge orifice area shall be equal to the nominal size of the valve. The valve design shall incorporate an over pressure safety feature that will fail without an explosive

effect. This feature shall consist of easily replaceable components such as gaskets, seals or the like.

The valves shall be tested in accordance with BSEN1074-4:2000.

6. Flow Control Valves

Pressure and flow control valves shall be installed as shown on the Contract Drawings and be suitable for the operating conditions specified.

The basic valves shall be either of the pressure compensating globe valve design with externally arranged spring and diaphragm assembly or of the streamline two chamber concentric plunger and pilot valve regulating assembly enclosed within the valve body as required for the particular applications.

Valve bodies shall be of a suitable grade of close-grained cast iron to BSEN1561:1997.

Valves shall be sized such that the fully open capacity is more than adequate to accept the specified maximum flow at the minimum differential pressure.

The globe valve design shall have the main seat in the stream flow and an upper cylinder for the valve element control piston type and shall have the required number of bosses drilled and tapped to receive strainer unit, relay valves and pressure gauges. The cover plate shall include an air vent and lifting eyes. The main seat shall have a renewable element and the upper portion shall be in the form of a piston and the lower portion shall have a face ring and ported guide.

Valves shall be fitted with an external control relay system which shall be capable of controlling the required parameter of flow or pressure within + or -5 per cent of the set value. The relay system shall include connecting piping couplings and isolating valves to permit maintenance or replacement without interrupting supply.

The rate of response of opening and closing of the main valve shall be adjustable and means for external indication of the main valve element position shall be fitted.

The particular control system for the different duties shall be as specified below.

a) Altitude Valves

The main valve shall be controlled by a slave ball cock mounted in the controlled tank at top water level and connected to the valve operating mechanism by small-bore pipework. The level of the ball shall be adjustable in service so that the main valve is fully drop-tight closed when the water level in the tank reaches top water level.

b) Flow Control Valves

Flow control valves shall be designed to prevent the flow downstream rising above that specified in the Particular Specification or shown on the Drawings for the particular application, regardless of the operating pressures in the system upstream or

downstream of the valve. The relay system valve shall be operated by the pressure differential measured across the main flow or if ice which shall be fitted at the upstream end of the flow control valve.

c) Pressure Reducing Valves

Pressure reducing valves shall be designed to reduce a constant or variable inlet pressure to a predetermined constant outlet pressure, at flows varying from the maximum capacity of the valve to zero flow. Adjustment of the outlet pressure shall be made by a screw on the relay valve or by changing weights as appropriate. A pressure gauge indicating downstream pressure shall be incorporated.

d) Pressure Sustaining Valves

Pressure sustaining valves shall be designed to maintain the pressure in the pipeline immediately upstream of the valve at or above a preset value, irrespective of the flow and pressure conditions downstream of the valve. Adjustment of the upstream pressure shall be made by a screw on the relay valve or by changing weights as appropriate. A pressure gauge indicating upstream pressure shall be incorporated.

e) Pressure Relief Valves

Pressure relief valves shall be designed to prevent the pressure in the pipeline immediately upstream of the valve rising above a preset value. The valve shall remain closed at lower pressures. Adjustment of the pressure at which the valve opens to relieve pressure shall be made by a screw on the relay valve or by changing weights as appropriate. A pressure gauge indicating upstream pressure shall be incorporated.

7. Float Valves

Float operated valves shall comply with BS 1212 and BS 1968 and BS 2456 "specifications for float ball valves".

Ball valves shall be the plastic diaphragm type or similar approved with seatings to suit the working pressure of 5bars with plastic float to BS2456 and internal over flow.

8. Painting of Valves

All valves shall be painted internally and externally to give the same standard of protection as for steel pipes and fittings. Surface protection shall be all to the approval of the Engineer.

5.7 Laying Pipes in Trenches and Headings

Immediately before pipes are placed in any trench, the bottom shall be cleared of all stone sand other debris and shall be in a condition acceptable to the Engineer. Prior to placing in the trench, all pipes shall be inspected for damage. Damaged pipes which in the opinion of the Engineer cannot satisfactorily be made good shall not be used in the permanent works. End caps or discs placed on the pipes for protection during transit shall not be removed until immediately before the pipes are jointed.

Pipes shall be laid in straight lines unless otherwise shown on the drawings. No pipe shall deviate from the true line and level by more than 5mm. Pipes shall be firmly be added throughout their length to the required alignment and level so that they are concentric at each joint. All pipes shall be suitably wedged, shored or otherwise restrained to prevent movement during testing and backfilling but such restraints shall not be left in place permanently unless instructed or agreed by the Engineer.

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

Unless otherwise agreed by the Engineer a close-fitting brush or swap shall be placed in pipelines having nominal diameters of 650mm or less and shall be drawn forward progressively as pipe laying proceeds by means of a suitable rope which shall be threaded through each pipe as it is laid. Pipelines having nominal diameters greater than 650mm shall be kept clean by suitable means as pipe laying proceeds. No debris of any kind shall be allowed to remain in the pipeline. Where the pipeline has internal lining, persons entering shall wear rubber boots and equipment trolleys shall have rubber tyred wheels. Pipes and joints shall be kept free of dirt, mud and other deleterious matter at all times. If pipe laying is stopped at any time, a cap shall immediately be placed on the end of the last pipe laid to exclude dirt.

Suitable precautions shall be taken to prevent the floating of pipes due to flooding of trenches. If floating should occur, the whole of the pipe run affected shall be removed

and trench prepared again. No pipes shall be re-laid in trenches which have flooded until the trenches and the pipes have been inspected by the Engineer. The Contractor shall be entirely responsible for the sufficiency of all temporary supports and side slopes to the excavations. The excavation shall be carried out in such a way as to maintain the stability of all roads and other adjacent structures or works.

Pipes having integral sockets shall be laid with sockets facing upstream unless otherwise agreed or instructed by the Engineer.

Pipes in headings shall be laid in accordance with the requirements of this clause but pipe lengths shall not exceed 1.5m unless otherwise agreed by the Engineer.

5.8 Pipes Laid on Natural Ground

Filling shall commence with selected fill consisting of easily compacted material from which all stones larger than 25mm and all lumps of clay larger than 75mm have been removed. The selected fill shall be deposited equally on each side of the pipe carefully compacted in layers not more than 150mm thick. Care shall be taken to ensure that no voids are left under the pipe. The filling shall be continued to a level of 300mm above the crown of the pipe

In the case of steel, ductile iron and plastic pipes, the Contractor shall ensure that no distortion of the pipe takes place during the backfilling operation.

The remainder of the trench shall be filled with excavated material and compacted in 150mm thick layers by means of a vibrating plate compactor or a mechanical rammer. The trench shall be filled flush with the surrounding ground surface.

5.9 Pipes laid on Granular Bedding

Granular bedding material shall be placed and compacted generally on both sides of the pipe up to the horizontal diameter of the pipe. Care shall be taken to ensure that no voids are left under the pipe. There after the selected fill shall be as described in Clause 5.8 above.

5.10 Pipes with Concrete Bedding and Surround

The configuration of the concrete bedding, surround or arch shall be as shown on the drawings including the location of reinforcement if any is required. Pipes to be set in concrete shall be supported as set out in Clause 5.7. Small diameter pipes in short lengths shall be supported behind pipe socket. Large diameter pipes and long lengths shall be supported on two packers.

After jointing and testing as set out in the appropriate parts of this section, concrete of the class shown on the drawings shall be carefully placed and compacted under the pipes making sure that no voids are left, and brought up to the configuration shown on the drawings. The Contractor shall ensure that the pipes do not float or are in any way

disturbed during concrete placing. The remainder of the backfill shall be placed as set out in Section 2 of this Specification.

Where pipes, which are laid on a bed of granular material, are to be protected by a concrete arch, the laying and jointing shall proceed as set out in the appropriate parts of the Specification and granular material shall be brought up to the horizontal diameters of the pipes.

After testing, concrete shall be placed over the pipes to the configuration shown on the drawings and the remainder of the backfill shall hereafter be placed as set out in Section 2 of this Specification.

Flexible joints shall be formed in concrete beddings, arches or surrounds in the location shown on the drawings. Such joints shall coincide with the pipe joint in such a way that the end of the socket is flush with one face of the joint and the socket faces into the joint space.

Joints in concrete beddings, arches and surrounds shall be 18 mm wide unless otherwise instructed by the Engineer and shall be filled with a compressible material such as a sheet of cane fibre board or cork board. The material used shall be subject to the approval of the Engineer.

5.11 Special Accessories for the Buried Pipe Network

1. Scope

This section of the specification concerns the supply and installation of accessories for the buried pipe network at the locations shown on the approved Drawings or as directed by the Engineer.

The several parts of the accessories, as described below, shall be considered as a complete unit, which will serve to supply water to the hydrant outlets from the underground distribution network. Each part shall be fabricated by an internationally recognized manufacturer and shall conform to the conditions of operation, the characteristics, the testing and other requirements described below.

The several parts of the accessories, as described below, shall be considered as complete unit, which will serve to supply water to the hydrant outlets from the underground distribution network. Each part shall be fabricated by an internationally recognized manufacturer and shall conform to the conditions of operation, the characteristics, the testing and other requirements described below.

The Contractor shall at the time and place required, submit to the Engineer proposals concerning the manufacturers selected by him for the supply of the accessories, accompanied by a detailed report, specifications and certificates showing that the proposed components have been successfully used in similar sprinkler systems, so as

to prove that the proposed accessories conform to the requirements of this specification in a satisfactory manner.

Subsequent to the provision and acceptance of the proposals as above, the Engineer may agree to the use of the proposed accessories, but his consent cannot be interpreted in any case whatsoever, as relieving the Contractor of his responsibilities for the supply of accessories which shall prove adequate and efficient during the testing procedure and the operation of the network.

The Engineer reserves the right, on the other hand to reject the Contractor's proposals if he finds the min complete or vague or if the proposed accessories do not conform to the requirements of this specification.

In such a case, within a reasonable period, not longer than one month, after communication of the above decision of the Engineer to the Contractor, the latter is required to supplement and improve his original proposals and submit his revised recommendations.

If the Contractor fails to submit, within the above time limit, his final recommendations, or if the Engineer for the same reasons rejects these for which his original proposals were rejected, he is required to supply accessories, which will satisfy the Engineer. If, however, he does not agree and insists on supplying the accessories which he has proposed, he must deposit a guarantee to an amount equal to the value of these accessories. This guarantee will remain in the hands of the Employer until the final acceptance and will be forfeited to the latter if, during the test procedure and the operation of the network, it is ascertained that the accessories supplied by the Contractor are not satisfactory. It is understood that the Contractor is, in addition, required to fulfill all his other obligations for the restoration of all defective construction until final acceptance by the Engineer.

2. Acceptance Tests

Included with the specifications submitted by the Contractor, shall be copies of any relevant international standards to which the items are to be constructed. The Engineer reserves the right to request independent authenticated tests at the point of manufacture and also similar tests in situ under operating conditions. All costs shall be borne by the Contractor who will promptly replace any components which, in the judgement of the Engineer are found, either after testing or during operation and until final acceptance, as not conforming to the requirements of this Specification.

3. Measurement and Payment

Measurement shall be by assessing the number of satisfactorily installed and accepted accessories.

Payment will be made for the number of accessories measured as described above and on the basis of the respective contract unit prices. Such prices and payment constitute full compensation to the Contractor for supplying, hauling, storing and installing the accessories, for paying patent rights, for furnishing the equipment, materials and labor required for installing and checking the operation of the accessories in accordance with the foregoing requirements, and for any other related expense even if not explicitly stated above but necessary for the complete and proper performance of the work and the satisfactory operation of the accessories.

4. Irrigation Hydrants

There are generally two types of hydrants as shown on the Drawings:

- Type1Plot hydrant
- Type2Fieldhydrant

5. Pressure Reducing Valves

There is a requirement for Pressure Reducing Valves, which will protect the installed pipelines against high pressures.

The Contractor shall submit to the Engineer proposals referring to the valves to be used and then name of the manufacturer with whom he intends to place the purchase order, accompanied by a detailed report, specifications and certificates showing that the proposed valves have been successfully used in similar cases so as to prove that the proposed valves conform to the requirement soft his specification in a satisfactory manner.

Following completion of the construction of the pipe network, and prior to its final acceptance, the engineer may demand the performance of tests to ascertain the efficiency and adequacy of the installed valves. To this effect, the Contractor shall, at his own expense, place at appropriate locations of the network to be designated by the Engineer automatic recording manometers with the minimum possible inertia of moving parts so as to ascertain in an unquestionable manner, the adequacy of the valves, especially during filling and draining of the network as well as on sudden opening and immediate shut down of a riser located at a relatively unfavourable point.

The Contractor shall take into account the fact that the valves must be" drop tight" or "sealed" at no flow conditions and that the seals and operating mechanisms must be proof against suspended solids in the supply water (untreated river water). The valves shall operate automatically, hydraulically, without electricity.

5.12 Joints in Pipelines

1. Concrete Pipes

Rigid Joints

When laying rigidly jointed pipelines with pipes having integral sockets, before entering pipe spigot into its socket, both spigot and socket shall be clean and free from mud, oil, grease or other deleterious matter. A gasket of tarred hempyarn, cut to length so that it forms a butt joint at the crown of the pipe shall be wrapped round the spigot which shall then be fully entered into the socket and the gasket caulked up hard into the joint. The joint shall then be filled completely with a plastic mortar composed of one part of cement to two parts of sand.

The pipes shall not be pressure tested or disturbed in any way for at least 48 hours after jointing.

Rigidly jointed sleeves used to join two spigots shall be jointed in the same manner as integral sockets.

If the drawings require ogee jointed pipes to be laid with a mortar joint, the joint shall be made at the time of laying. Mortar as described above shall be applied to the lower semi-circumference of the socket and to the upper semi circumference of the spigot and the pipe shall be drawn hard into the socket. Excess mortar squeezed out of the joint shall be removed from both the inside and outside of the joint.

Flexible Joints

Flexible joints between pipes having integral socket may be formed by a shaped rubber gasket fitted within the socket or by a rubber ring of circular cross section (O-ring) placed on the pipe spigot. The type of flexible joint to be used shall be subject to the approval of the Engineer and shall be made strictly in accordance with the manufacturer's recommendations.

2. PVC-U Pipes

Flexible jointed PVC-U pipes shall be jointed in accordance with the manufacturer's instructions.

Solvent welded joints shall be made strictly in accordance with the manufacturer's instructions using solvent supplied by him for exposed pipes.

3. Steel Pipes

These shall be caulked in thread seal for rigid joints. Flexible joints incorporating rubber O-rings shall be made in accordance with the manufacturer's instructions. Joints incorporating bolted or screwed glands or couplings shall be made in accordance with the manufacturer's instructions.

Components of flexible joints from different manufacturers shall not be used together.

5.13 Connections to Existing Pipelines

Where a connection is to be made to an existing water pipe other than that at a chamber, a pipe saddle of the correct size shall be used for this purpose. The hole in the pipe shall be cut precisely to fit the saddle.

Saddles for UPVC pipes shall be made of the same material as the pipes and shall be fixed with a solvent in accordance with the manufacturer's instructions.

5.14 Pipes through Structures

Where a pipeline passes into or out of a structure, including a manhole cover or similar chamber, two flexible joints shall be formed. The flexible joint shall consist of a 500mm long pipe section connected along the main pipe, with the nearest end 500mm from the face of the structure. One joint will be made on the incoming pipe and another joint on the outgoing pipe.

When the structure is less than one pipe length wide, the above requirement shall not apply and a sleeve shall be formed through the structure so that there is a clear space at least 75mm wide all-round the pipe. Adequate means shall be provided to prevent soil from entering this gap.

5.15 Pipelines within Concrete Structures

Sections of pipelines which are to be cast into concrete may be installed in advance of the remaining parts of the pipeline subject to the agreement of the Engineer. Such sections shall be placed accurately into position and fixed so that they cannot move during placing of concrete around them.

5.16 Pipes under Roads

All pipes at the crossing of driveways and roads shall be surrounded with concrete for the entire length of crossing before trench backfilling.

Concrete surround shall be approved by the Engineer on satisfactory compliance with protection of pipes as detailed in Section 5.9.

5.17 Cleaning

The insides of all pipes, valves, tanks and fittings shall be clean, smooth, and free from blister, loose scale and dirt when erected. All lines shall be cleaned after all installation work.

When pipes are installed all ends shall be suitably plugged until final fixing of fixtures can be carried out. Pieces of cloth or stone will not be permitted.

5.18 Pressure Testing of Pipelines

As the installation of the pipework proceeds, the various sections shall be tested before they are built in, concealed, or finally connected. The Contractor shall advise the Engineer in writing at least three days in advance of the carrying out of such tests, and such tests shall, if considered necessary by the Engineer, be carried out in his presence.

All tests shall be at the expense of the Contractor and it shall be the responsibility of the Contractor to make all necessary records of the tests and results and submit these to the Engineer in the final form agreed.

All pipe systems shall be tested hydraulically for a period of one hour to not less than one and a half times the design working pressure. Testing shall comply with BS EN 805:2000 for standard field testing of pipelines.

If preferred, the Contractor may test the pipelines in sections. Any such section found to be satisfactory need not be the subject of a further test when the system has been completed, unless specifically requested by the Engineer.

During the test, each branch and joint shall be examined carefully for leaks and any defects observed shall be made good by the Contractor and the section re-tested.

5.19 Painting of Exposed Pipes and Fittings

All metal surfaces within chambers shall be mechanically wire brushed to remove all loose scale, grease etc. Within two hours of cleaning a primer shall be applied, followed after two hours by a first coat of heavy consistency bitumen paint all to the approval of the Engineer. A second coat of the heavy consistency paint shall be applied after 24 hours. The final coating thickness shall not be less than 250microns.

Preparation and application of the coating system shall be strictly in accordance with the Manufacturer's instructions.

This clause shall not be applied to chemically or thermally bonded coatings on steel pipes.

5.20 Marker Posts

Precast concrete marker posts shall be set in concrete and fixed near valves, fire hydrants, washouts, changes in direction of the mains and where directed by the Engineer. The posts shall be detailed as directed by the Engineer.

5.21 Portable Sprinkler Irrigation Equipment

1. Scope

The Tender involves the supply of sprinkler irrigation equipment for overhead irrigation.

The contractor shall have submitted with his Tender detailed specifications as to the dimensions, type and materials utilized in sprinkler construction, together with any detail that the Contractor may consider to be relevant.

The Contractor shall at the time and place required submit to the Engineer proposals concerning the manufacturers selected by him for the supply of the portable sprinkler irrigation equipment accompanied by a detailed report, specifications and certificates showing that the proposed components have been successfully used in similar sprinkler systems so as to prove that the proposed equipment conforms to the requirements of this specification in a satisfactory manner.

Subsequent to the provision and acceptance of the proposals as above, the Engineer may agree to the use of the proposed equipment, but his consent cannot be interpreted in any case whatsoever, as relieving the Contractor of his responsibilities for the supply of equipment which shall prove adequate and efficient during the testing procedure and the operation of the network.

The Engineer reserves the right, on the other hand, to reject the Contractor's proposals if he finds them incomplete or if the proposed equipment does not conform to the requirements of this specification.

In such a case, within a reasonable period, not longer than one month, after communication of the above decision of the Engineer to the Contractor, the latter is required to supplement and improve his original proposals and submit his revised recommendations.

If the Contractor fails to submit, within the above time limit, his final recommendations or if these are rejected by the Engineer for the same reasons for which his original proposals were rejected, he is required to supply portable sprinkler irrigation equipment which will satisfy the Engineer. If, however, he does not agree and insists on supplying the equipment which he has proposed, he must deposit a guarantee to an amount equal to the value of the equipment. This guarantee will remain in the hands of the Employer until the final acceptance and will be forfeited to the latter if during the test procedure and the operation of the network, it is ascertained that the portable sprinkler irrigation equipment supplied by the Contractor is not satisfactory. It is understood that the Contractor is, in restoration of all defective construction until final acceptance by the Engineer.

2. Acceptance Tests

Included with the specifications submitted by the Contractor shall be copies of any relevant international standards to which the items are to be constructed. The Engineer reserves the right to request independent authenticated tests at the point of manufacture and also similar tests at the point of manufacture and also similar tests in

situ under operating conditions. All costs shall be borne by the Contractor who will promptly replace any equipment which in the judgment of the Engineer is found, either after testing or during operation and until final acceptance, as not conforming to the requirements of this Specification.

3. Measurement and Payment

Measurement shall be made by assessing the number of satisfactorily installed and accepted items of portable sprinkler irrigation equipment.

Payment will be made for the number of items measured as described above and on the basis of the respective contract unit prices. Such prices and payment constitute full compensation to the Contractor for supplying, haulings to ring and installing the equipment for paying patent rights for furnishing the equipment, materials and labor required for installing and checking the operation of the item sin accordance with the fore going requirements, and for any other related expense even if not explicitly stated above, but necessary for the complete and proper performance of the work and the satisfactory operation of the portable sprinkler irrigation equipment.

6. STEELWORK

6.1 General

Except where otherwise specified, structural steel shall be grade 43, complying with BS7668, "Specification for weldable structural steels".

All structural rolled steel members shall comply in dimension, weight and tolerance with that shown on the drawings and with BS4, "Structural steel sections" and BSEN 10056, 10067 and 10210.

6.2 Bolts, Nuts and Fastenings

Bolts, studs, nuts and washers etc. shall be of mild steel unless otherwise specified. The dimension and tolerances of nuts and bolts shall comply with BS4190, "Specification for ISO metric black hexagon bolts, screws and nuts" or where specified to BS3692, "Specification for ISO metric precision hexagon bolts, screws and nuts" and the threads shall be to BS 3643 "ISO metric screw threads". The heads of the bolts shall be forged out of the solid bar and the ends shall be cleanly cut with standard threads and the nuts must fit the bolts accurately and tightly. Washers of the shape and type indicated on the drawings shall comply with BS4320, "Specification for metal washers for engineering purposes". Where nuts, bolts and washers are required to be galvanized, the galvanizing shall be to BS3382 "Specification for electroplated coatings on threaded components".

6.3 Electrodes

Electrodes used in welding mild steel shall comply with the requirements of BS639, "Specification for covered carbon and carbon manganese steel electrodes for manual metal-arc welding".

6.4 Contractor's Shop Drawings

Where the Contractor is required to undertake the detailed design of the steelwork components, he shall provide the Engineer with copies of detailed shop drawings for approval at least fourteen (14) days before commencing fabrication. The Contractor shall be responsible for the detailed design of all connections and these shall be fully detailed on the shop drawings together with all dimensions, clearances, welding details and procedures, machining, marking, etc. The Contractor shall not commence fabrication until he has received the Engineer's written approval of the shop drawings. Approval of such drawings

shall in no way relieve the Contractor of his responsibility for accuracy or the correct operation of the component.

6.5 Fabrication and Erection of Steel work

The standard of workmanship and engineering practices to be adopted for fabrication and erection shall conform to BS449, "Specification for the use of structural steel in building" and BS5531, "Code of practice for safety in erecting structural frames".

The Contractor shall supply samples of materials and standards of workmanship as required by the Engineer. All samples approved by the Engineer shall be retained and shall be considered as setting the standard for all subsequent work.

Inspection of work will be carried out by the Engineer and the Contractor shall give sufficient notice of the date when fabricated steelwork is ready for inspection. The Contractor shall provide particulars of places and dates of manufacture of all materials for the Permanent Works and the names of the manufactures. Copies in duplicate of all orders for materials shall be sent to the Engineer at the time of placing such orders.

The Contractor shall ensure that all foundation bolts and supports including built-in bolts, etc. upon which the steelwork is to be erected are in the correct position and that the steelwork fits correctly in required positions without forcing or straining in any way. Any check by the Engineer of the Contractor's measurements shall not relieve him of his responsibility for obtaining this fit unless any errors in position are clearly not attributable to him.

No permanent bolting or site welding shall be done until proper alignment has been obtained. The Contractor may use temporary jigs, anchors or supports during erection, but must allow for thermal movement to take place freely at all times.

If the Contractor wishes to drill holes in or fix attachments to the steel work to carry temporary work such as shuttering, he shall obtain the Engineer's approval of the positions and details of all such holes or attachments and shall close such holes and remove the attachments to the satisfaction of the Engineer.

On completion of erection of any part of the steelwork on which the Contractor wishes to add further works, such as roofing, he shall first obtain the Engineer's approval of the steelwork and remedy any defects required by the Engineer. Any approval given shall in no way relieve the Contractor of his responsibility for ensuring the subsequent correct positioning and behavior of the steel work of other parts of the structure.

6.6 Welding

All shop welds shall be carried out by qualified welders who shall be under competent supervision. All welding is to be carried out in accordance with BS 5135, "Specification for arc welding of carbon and carbon manganese steels". The Contractor's proposals for welding shall be submitted to the Engineer for approval before any work is undertaken.

The Engineer may call for a test of a welder's capabilities in accordance with BS 4872, "Specification for approval testing of welders when welding procedure is not required".

In the case of site welds, the welding procedure for making each type of joint shall be approved by the Engineer before the work is commenced and the Contractor shall make such trial welds as the Engineer may require to demonstrate the soundness of the proposed method and the competence of his workmen.

Where site welding is used all welded joints shall be subject to inspection by the Engineer. Any welds that are in the opinion of the Engineer defective shall be cut out and the welds remade to the satisfaction of the Engineer. The cost of such corrective measures including any resultant delay shall be borne by the Contractor.

6.7 Painting General

The Contractor shall submit to the Engineer for his approval details of the types and manufacturers of paints he is proposing to use, together with the manufacturer's recommendations concerning preparation of surfaces, primers and undercoats, application methods, safety precautions and drying times for each type of paint. All paints used in the Works must be supplied ready-mixed in unbroken, sealed containers, which clearly show the type, colour and manufacturer of the paint and carry detailed "instructions for use".

All metal surfaces on which paint is to be applied shall be blast cleaned as laid down in BS7079, "Preparation of steel substrates before application of paints and related products", or other mechanical means and fully prepared in accordance with the manufacturer's recommendations. Applications of paint coatings on external work shall not be carried out or continued in mist, rain or excessively damp conditions. The Contractor shall take all necessary precautions to prevent dust and dirt coming into contact with freshly applied paint before it has dried.

Paints shall be applied either by brushing or spraying in accordance with the manufacturer's instructions. The thinning of paints shall not be permitted without the approval of the Engineer. Unless otherwise recommended by the manufacturer, the minimum interval between the application of a first coat of paint and the second shall be twenty-four hours (24hrs). Special care shall be taken to ensure complete coverage of all corners, arises and openings without causing an excessive build-up of paint and avoiding runs.

Steelwork to be painted shall be clean and free from all rust, grease, oil and mill scale.

6.8 Painting Steelwork Immersed in Water

Steelwork subject to immersion in water shall be blast cleaned or thoroughly mechanically cleaned by an approved alternative process and immediately coated before leaving the factory with zinc phosphate or similar compatible metallic inhibitive primer with a minimum dry film thickness of 50 microns. Following drying of the primer, the steelwork shall be coated with one coat of non-toxic tainting, high build bit nous paint to BS3416.

"Specification for bitumen-based coating for cold application, suitable for use in contact with potable water", having a minimum dry film thickness of 100microns.

After erection, damaged areas of steelwork shall be mechanically cleaned and touched up with primer and bituminous paint to fully restore the factory applied coating system and thickness.

Finally, two overall finish coats of bituminous paint with a minimum dry film thickness per coat of 100 microns giving an overall minimum dry film thickness of the complete coating system of 350 microns.

6.9 Painting another steelwork

Where steelwork, which is not galvanized and not subject to immersion in water is required to be painted, it shall be thoroughly cleaned and painted prior to leaving the factory with:

- . One coat of zinc phosphate or similar compatible metallic inhibitive primer with a minimum dry film thickness of 50microns.
- . One coat of red lead primer with a minimum dry film thickness of 50microns.
- . Two coats of micaceous iron oxide undercoat paint with a minimum dry film thickness per coat of 50microns.

After erection, damaged areas of steelwork shall be mechanically cleaned and touched up with primer and undercoat to fully restore the factory applied coating system and thickness.

Finally, one overall finish coat of enamel gloss micaceous iron oxide paint with a minimum dry film thickness of 50microns giving an overall minimum dry film thickness for the complete coating system of 250microns.

6.10 Galvanizing

All steel and ironwork of whatever kind required to be galvanized is to be pickled in dilute hydrochloric acid and then washed, fluxed and stoved and coated with zinc by dipping in a bath of molten zinc. All components are to be immersed in the bath only for the time sufficient for them to attain the temperature of the bath, they are then to be withdrawn at such a speed that a coating of 80 microns thickness is achieved, or such other practical maximum thickness for the component as defined in BN EN ISO 1461:1999, "Specification for hot dip galvanized coatings on iron and steel articles".

The galvanizing is to be carried out after all drilling, chipping, trimming, filing; fitting and bending operations are complete and shall cover all faces evenly.

After erection of galvanized steel components, damaged or welded areas shall be painted immediately after cleaning with two coats of metallic zinc primer with each coat having a thickness of 50microns. The paint shall be applied strictly on accordance with the manufacturer's instructions and shall be compatible with any subsequent paint systems to be applied.

6.11 Galvanized Handrails

Handrail tubes shall be 38mm nominal diameter steel tube to BS1387, "Specification for screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads". The top and bottom rails shall be 900mm and 450mm respectively above floor level. The rails and vertical standards shall be connected using screwed steel pipe fittings to BS1740, "Specification for wrought steel pipe fittings (screwed BS21R-series threads)", where practical with the final connections being welded in accordance with Clause 6.6.

The handrail assembly shall be securely mounted on base plates fabricated of mild steel and attached to the base or foundation slab in a manner to be approved by the Engineer.

All sharpened edges and rough areas shall be carefully ground off and the entire handrail assembly cleaned and galvanized in accordance with Clause 6.10.

6.12 Gates

Gates of the types and sizes shown on the drawings shall be supplied and installed where indicated on the drawings. The gate shall be drop-tight and shall be suitable in all respects for use in raw water. The gates shall have flush inverts.

Gates shall be supplied complete with all frames, cills, gates, seals, spindles, handwheels and headstocks as required.

The frames and gates shall be fabricated in galvanized steel.

All gates shall have rising spindles with protection tubes, head-stock, hand-wheel etc. and intermediate supports where the spindle is longer than 1500mm. Intermediate guide brackets are to be located 600mm above the gate frame, 400mm below the base of the headstock and at a maximum spacing of 1500mm, to suit or as recommended by the manufacturer and as approved by the Engineer.

6.13 Stoplogs

Where shown on drawings the stop-logs shall be hardwood of the stated dimensions and shall be approved by the Engineer before supplying to site. Where shown on the drawings stop-logs shall be bolted to steel frames of stated dimensions to form hard wood gates.

SECTION VI-DRAWINGS

Note1. A list of drawings should be inserted here

2. The actual drawings including Site plans should be annexed in a separate booklet
- ANNEX

SECTION VII- BILLS OF QUANTITIES

5. Objectives

The objectives of the Bill of Quantities are:

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

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost.

Consistent with these requirements, the layout and contents of the Bill of Quantities should be as simple and brief as possible.

6. Day work Schedule

A Day work Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high.

To facilitate checking by the Procuring Entity of the realism of rates quoted by the Tenderers, the Day work Schedule should normally comprise the following:

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

7. Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities.

Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary priced Bill of Quantities.

The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises.

Where such provisional sums or contingency allowances are used, the Special Conditions of Contract should state the manner in which they shall be used, and under whose authority (usually the Project Manager's). The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description.

A separate procurement procedure is normally carried out by the Procuring Entity to select such specialized contractors.

To provide an element of competition among the Tenderers in respect of any facilities, amenities, attendance, etc., to be provided by the successful Tenderer as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Tenderer to quote a sum for such amenities, facilities, attendance, etc.

These Notes for Preparing a Bill of Quantities are intended only as information for the Procuring Entity or the person drafting the tendering document.

They should not be included in the final tendering document.

8. The Bills of Quantities

The Bills of Quantities should be divided generally into the following sections: a) Preambles

- b) Preliminary items
- c) Work Items
- f) Day work Schedule; and
- g) Provisional items
- h) Summary.

9. **The Summary to the Bills of Quantities** will take this form or some other form but including these items.

GRAND SUMMARY		
Bill No.	Description	Amount (KSh)
1	Preliminaries and General	
2	Intake Works	
3	Sedimentation Tank	
4	River & Gully Crossings	
5	Conveyance Pipeline	
6	Main lines	
7	Sub-Mains	
9	In-Field System	
	Sub-Total	

	Contingencies (5% of Sub-total)	
	GRAND TOTAL	

Bill No .1- PRELIMINARY AND GENERALS			BoQs		
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)

1.1	Contractor's Camp				
1.1.1	Provide for establishment, mobilization and demobilization of the Contractor's camp together with all the required equipment's	LS	1		
1.2	Resident Engineer's Office				
1.2.1	Allow for renting of the office in accordance with the Specifications for the use of the Resident Engineer and his staff	Month	6		
1.2.2	Furniture and Equipment for the Engineer's Office and in accordance with Specifications and as directed by the Engineer	P.C Sum	1		1,200,000
1.2.3	Allow PC Sum for operation and maintenance of the office in accordance with the Specifications.	Month	20	35,000	700,000
1.2.4	Provide for payment of miscellaneous accounts for Stationery, office consumables etc. as directed by the engineer (Prov. Sum)	Month	20		800,000
1.2.5	Allow for Attendance	%	20%		

1.3	Concrete Strength Tests				
1.3.1	Concrete Strength tests (six cubes / test) in accordance with the Specifications.	Lump Sum	10		
1.4	RE/IWUA Office				
1.4.1	Provide and construct the Engineer's office, floor area 105m ² including all services and fittings in accordance with clause 1.27 of the Specifications and as directed by the Resident Engineer. Rate to include detailed design and preparation of Drawings	Lump Sum	1	2,800,000	2,800,000
1.4.1	Provide all materials and construct 2No VIP latrines including a urinal as per the specifications	Lump Sum	1	500,000	500,000
1.5	Supervision by the Engineer				

1.5.1	Allow a provisional sum for supervision of the project for 24 months	PC Sum	24	200,000	4,800,000
1.5.2	Allow a Provisional cost to be used for backstopping by the Project Manager	PC Sum	1		1,200,000
1.5.3	Contractor's mark-up for profit and overheads in respect to Items 1.5.1 & 1.5.2		20%		
1.6	Survey Equipment and Chainmen				
1.6.1	Acquire and maintain automatic level and accessories as per the specifications and hand over to the Employer at the end of the contract.	Lump Sum	1		
1.6.2	Allow for Confirmatory survey and Design Review if required, and as directed by the Resident Engineer.	PC Sum	1	2,500,000	2,500,000
1.7	Signboards				
1.7.1	Provision, erection and maintenance of project signboards in accordance with the Specifications.	No.	3		
1.7.2	Allow a provisional sum to be spent in whole or part, for HIV/AIDS prevention activities and campaigns to be spent as directed by the Engineer	PC Sum	1		250,000
1.8	Resident Engineer's Staff and Vehicles				

1.8.1	Allow a provisional sum for the purchase of 1No. 4WD vehicle, New and Unused Station Wagon SUV, of engine capacity of between 2,800cc-3,200cc , turbo engine, diesel propelled vehicle, to revert to the Employer at the end of the Contract. The vehicle to be inspected by Chief Mechanical Engineer before delivery. The vehicle to be comprehensively insured.	Provisional Sum	1		15,500,000
1.8.2	Provisional Sum for running and maintenance of vehicles throughout the duration of the Contract. Rate to include service, spare parts and fuel	Provisional Sum	1		3,500,000
1.8.3	Allow a provisional sum for the purchase of 2No. 150cc 4-stroke trail motor cycle, to revert to the Beneficiaries at the end of the Contract	Provisional Sum	2	250,000	500,000
1.8.4	Provisional Sum for running and maintenance of motorcycle throughout the duration of the Contract. Rate to include service, spare parts and fuel	Provisional Sum	2		200,000
1.8.5	1 No. Drivers for Resident Engineer's vehicles	Months	22	30,000	660,000
1.8.6	Provisional sum for Facilitation of 2 No. Assistant Engineers of the Resident Engineer in the duration of the Contract including payment for professional license.	Provisional Sum	1		1,000,000
1.8.7	Allow for provisional sum for IWUA formation and capacity building for the Mbugiti Irrigation Project Members and Officials	Provisional Sum	1		5,400,000

1.8.8	Contractor's mark-up for profit and overheads in respect to Items 1.8.1 - 1.8.7	%	20%		
1.9	Access Road to intake				
1.9.1	Allow for Provisional Sum for construction of access road to the intake site during construction	m	500		
1.10	Marker Posts				
1.10.1	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	500		
1.11	Testing and commissioning of the works				
1.11.1	Operate completed project for 15 days prior to handing over including all costs.	Days	15		
1.11.2	Allow for provision of Operation and Maintenance Manuals (O&M) in accordance with Clause 139 - General and Particular Specifications of bidding document volume II	Item	LS		200,000
1.12	ESIA & Hydrological studies				
1.12.1	Allow provisional sum for hydrological study at the proposed intake site before commencement of construction	Provisional Sum	1	500,000	500,000

1.12.2	Allow provisional sum for ESIA study for the entire project location and surrounding.	Provisional Sum	1	900,000	900,000
1.12.3	Provide for the Work Insurance, Third Party insurance and insurance against injury to workmen.	L.S	1	200,000	200,000
1.13	Environment Social Health and Safety (ESHS)				
1.13.1	Provision sum for Compliance with Environment Social Health and Safety (ESHS) as per the ESMP	Provisional Sum	1	300,000	300,000
1.14	Other Works, Obligations				
1.14.1	The Contractor shall describe in detail hereunder other works, obligations and things which may be referred to in the Specifications or which he may consider have been omitted from the Bills of Quantities and for which he desires to enter a separate charge (the charge to be carried direct to the amount column). FULL DESCRIPTION OF ITEM(S) OF WORK OR ANY OTHER ISSUE SHOULD BE MADE. If no separate charge is made hereunder, the rates in the Bills of Quantities will be held as covering all expenses for all such works	Lump Sum	1		100,000
	TOTAL CARRIED OVER TO GRAND SUMMARY				

Bill No.2 - Intake Works					
ITEM	DESCRIPTION	UNIT	QTY.	RATE (KSh)	AMOUNT (KSh)
2.1	SITE CLEARANCE AND SETTING OUT				
	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc. and dispose as specified with respect to weir and intake locations	m ²	72		
2.2	RIVER DIVERSION/ACCESS TO INTAKE SITE				
2.2.1	Provide for river diversion works and/or coffer dam. Price to include for all labor, materials and superintendence during the construction period, and reinstatement at the end.	Lump Sum	1		
2.2.2	Provide for access road to site and temporary camp/storage area at intake.	Lump Sum	1		
2.3	EXCAVATION/EARTHWORKS/CUTTING				
	To include for all trimming to levels, backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement.				
2.3.1	In normal soil for extended retaining wall to depth n.e 1.5 m and form sections as specified.	m ³	15		
2.3.1	In rock for retaining wall to depth n.e 1.5 m and form sections as specified.	m ³	25		
2.3.1	In rock to for intake chamber to depth n.e 2.0 m and form sections as specified.	m ³	30		
2.3.1	Cut 2.5 m width in weir body for sluiceway as shown in the drawing.	m ³	15		
2.4	CONCRETE WORKS				
	Provide and place the following concrete mixes including all form-work.				

2.4.1	RC concrete grade 20/20 for intake Weir, chamber walls and floor	m ³	60		
2.4.2	Ditto for sluiceway walls, foundation and slab	m ³	5		
2.4.3	Ditto for extended retaining wall and base	m ³	5		
2.4.8	Blinding concrete grade 15/40, 75 mm thick to weir body, intake chambers, retaining walls and wing walls	m ³	20		
2.4.9	Reinforcement				
	Provide support and fix the following reinforcement, including all cutting, bending and supports for weir body, floors, walls, slabs, etc. as shown in the drawings				
2.4.9.1	D12	Kg	2200		
2.4.9.2	D10	Kg	1800		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
2.5	PROTECTION WORKS				
2.5.2	Provide and place selected stones in mass concrete (1:1) as shown	m ³	15		
2.5.2	Provide and place tipped rock as specified and as shown in the drawings	m ³	25		
2.6	METALWORKS				
2.6.1	Supply and install galvanized steel trash rack complete with all fixing iron monger to intake as specified.	No.	1		
2.6.3	Supply and install metal slide gate to intake pipe as shown	No.	1		

2.6.4	Supply and install galvanized sluice gate as specified / shown in the drawings 500x500mm	No.	3		
2.7.5	Provide and place debris screens as specified/shown in the drawings	No	2		
2.6.4	Provide and install MS cover plates complete with hinges/locks as shown in the drawings and as directed by the Engineer.	Sum	1		
2.7	INTAKE CHAMBER PIPEWORK AND FITTINGS				
	Provide, handle, install and test the following steel pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
2.7.1	355mm dia double flanged 6m long steel pipe	No.	2		
2.7.2	355mm 90-degree double flange bend	No.	1		
2.7.3	Dia 355 mm x1m length Double flanged spigot pipe	m	1		
2.7.4	Scour pipes dia 200 mm flanged, 2m length GI pipe as shown	No.	1		
2.7.5	200 mm Dia. Double sluice valve	No.	1		
	TOTAL CARRIED OVER TO GRAND SUMMARY				

Bill No. 3 - SEDIMENTATION BASIN					
ITEM	DESCRIPTION	UNIT	QTY.	RATE (KSh)	AMOUNT (KSh)
3.1	EXCAVATION				

	To include for all trimming to levels, backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement for sedimentation basin, drainage chambers and washout structure.				
3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc. and dispose as specified with respect to weir and intake locations	m ²	30		
3.1.2	In normal soil (material) to a depth not exceeding 1.5	m ³	45		
3.1.3	E.O. for Item 2 for excavation in rock (provisional)	m ³	57.50		
3.2	CONCRETE WORKS				
3.2.1	Provide and place the following concrete including all form work.				
3.2.2	Blinding concrete grade 15/40 - 75 mm thick	m ³	8		
3.2.3	Reinforced concrete grade 20/20 as shown on drawings	m ³	55		
3.3	REINFORCEMENT				
3.3.1	Provide, support and fix the following reinforcement, including all cutting, bending and supports.				
3.3.2	High yield bars	kg	2200		
	Inlet and Outlet Pipe work and Fittings				
	The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.				
3.3.3	Inlet Chamber				
3.3.3.2	Dia 355 mm Flange Ductile Iron/GI/Steel 90 deg double flanged elbow (short radius bend)	No.	2		

3.3.4	Outlet Chamber				
3.3.4. 1	Dia 355 mm single flanged spigot pipe x 1000mm length	No.	1		
3.3.4. 2	Dia 355 mm double flanged spigot pipe x 1000mm length	No.	3		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	Outlet Chamber Cont.				
3.3.4. 4	Dia 400 mm double flanged spigot pipe x 1000m length	No	3		
3.3.4. 5	Dia 400mm Sluice valve	No.	1		
3.3.4. 6	Dia. 400/400V/ GI/uPVC flanged adaptor	No.	2		
3.3.4. 7	Provision for an air vent on the outlet pipe dia. 50mm, 1000m long after sluice valve	No.	1		
3.3.4. 8	Excavate for, provide all materials and construct complete sluice valve and meter chamber 1500x1500x1500mmas specified/shown in the drawings. Rates to include for all thrust blocks and pipe supports.	No.	2		
3.3.5	Drainage Chamber Piping				
3.3.5. 1	Dia 200 mm steel pipe with Dia 200 mm dia pipes welded as shown on drawings	m	18		
3.3.5. 2	Dia 200 mm flange sluice valve	No	3		
3.3.5. 3	Dia 200 mm flanged adaptor	No.	6		
3.3.5. 4	Dia 200 mm uPVC pipe	m	36		

3.3.5.5	Supply and Install Manhole covers as shown	No.	2		
3.3.7	Drain chambers				
3.3.7.1	Excavate for, provide all materials and construct water drain chambers 1500x1500x1500mm as shown in the drawings	No.	3		
	Provide, handle, install and test steel (or GI)/uPVC pipes and fittings, valves and specials for the water meter chamber				
	Rates shall include for completing all pipe joints as specified in the specification				
3.3.7.2	Water meter to fit Steel 355mm dia pipe	No.	1		
5.3	STEEL PIPEWORKS				
	Provide, lay, Joint and test the following steel pipe and fittings. Rates to include for the supply of V/J coupling for each pipe joint, all jointing materials, cutting, wastage, joint works and poured bitumen for completing pipe protection.				
5.3.1	355 mm dia Double flange	m	6		
	TOTAL CARRIED OVER TO GRAND SUMMARY				

Bill No 4	RIVER AND GULLY CROSSINGS ON CONVEYANCE PIPELINE AT CHAINAGES 1125 & 3366m				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)
4.1	SITE CLEARANCE AND SETTING OUT				
4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc. and dispose as specified with respect to anchor blocks	m ²	20		

4.2	EXCAVATION				
	To include for all trimming to levels, backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement for anchor blocks and pipe encasement concrete				
4.2.1	In normal soil to a depth not exceeding 1.0 m.	m ³	80		
4.2.2	In murram/soft rock to a depth not exceeding 3 m.	m ³	20		
4.3	CONCRETE WORKS				
	Provide and place the following concrete mixes including all form-work.				
4.3.2	Mass Concrete class 20/20 for anchor blocks / pipe supports	m ³	24		
4.3.4	Reinforcement				
	Provide support and fix the following reinforcement, including all cutting, bending and support for piers				
4.3.5	High yield bars	kg	640		
4.4	PIPE WORKS				
4.4.1	Dia 355 mm double flanged bends	m	4		
4.4.2	355/355 mm diadouble flanged adaptor	No.	2		
4.5	PROTECTION WORKS				
4.5.1	Provide all materials, lay and place grouted rip rap (mortared stone pitching) 250 mm on sloping sides.	m ³	100		
	TOTAL CARRIED OVER TO GRAND SUMMARY				

Bill No.5 - Conveyance_1 Pipeline 7800 m					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)
5.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications.				
5.1.1	Excavation and backfilling in trench normal material for Dia 355mm pipe for depth not exceeding 1.5 m	m ³	7800		
5.1.2	E.O for excavation in soft rock (provisional)	m ³	390		
5.1.4	E.O for excavation in hard rock (provisional)	m ³	156		
5.2	HDPE Pipework				
5.2.1	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN6 60	m			
	PN8 80	m			
	PN10 100	m			
	PN12.5 125	m			
	PN16 160				
	HDPE Straights				
	PN 8				
5.2.2	355 mm dia	m	7800		
5.3	STEEL PIPEWORKS				
	Provide, lay, Joint and test the following steel pipe and fittings. Rates to include for the supply of V/J coupling for each pipe joint, all jointing materials, cutting, wastage, joint works and poured bitumen for completing pipe protection. For all pipes less than 100 mm diameter joints				

	shall be made with screwed socket couplings:				
5.3.1	355 mm dia	m	240		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
5.5	AIR VALVES				
5.5.1	Excavate for, provide all materials and construct complete air valve chambers. Internal dimensions 1500 x 1500 x 1500 mm. Rates to include for all thrust blocks, pipe supports, inspection covers, etc. as detailed in the drawings.	No.	7		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the specification				
	7No. Double Air Valves (DAVs)				
5.5.2	355 / 355mm dia PVC U/Steel coupling	No.	14		
5.5.3	355mm dia x 1000mm double flanged GI pipe	No.	14		
5.5.4	355x355 mm x 80 mm flanged GI tee	No.	7		
5.5.5	80 mm dia x 0.4 m long double flanged GI pipe	No.	2		
5.5.6	80 mm dia flanged sluice valve	No.	7		
5.6	WASHOUTS (W/O)				
5.6.1	Excavate for, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	7		

	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the specification				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	For 4 NO. Wash Outs Fittings				
5.6.2	355/ 355mm dia GI/HDPE adaptor	No.	14		
5.6.3	355mm dia x 1000mm double flanged GI pipe	No.	14		
5.6.4	355 x355mm x 160mm GI tee double flanged	No.	7		
5.6.5	160 mm dia flanged sluice valve	No.	7		
5.6.6	160 mm dia x 1m mm long single flanged GI pipe	No.	7		
5.7	BENDS & VJ COUPLING				
	GI fittings (Vertical Bends)				
	400mm dia				
5.7.3	22.5 deg flange	No.	2		
	11.25 deg				
5.7.4	355mm dia flange	No.	2		
	22.5 deg				
5.7.5	355 mm dia flange	No.	2		
	45 deg				
5.7.6	355 mm dia flange	No.	2		
	90 deg				
5.7.7	355 mm dia Flange	No.	2		

5.7.8	355 mm double flanged VJ Coupling	No.	5		
	TOTAL CARRIED OVER TO GRAND SUMMARY				

Bill No. 6 - MAIN PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
6.1	Mainline Gitundu	
6.2	Mainline Karangi_Mbugiti	
6.3	Mainline Mbugiti RD	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

Bill No 6.1 - Gitundu_Main -3339m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
6.1.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
6.1.1.1	Excavation and backfilling in normal material for Dia 160 mm&110mm pipe for depth n.e 1.0 m	m ³	1603		
6.1.2	HDPE Pipe Work				

6.1.2.1	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN8				
6.1.2.2	160 mm dia	m	1280		
6.1.2.3	110mm dia.	m	2059		
6.1.3	STEEL PIPEWORKS				
	Provide, lay, Joint and test the following steel pipe and fittings. Rates to include for the supply of V/J coupling for each pipe joint, all jointing materials, cutting, wastage, joint works and poured bitumen for completing pipe protection. For all pipes less than 100 mm diameter joints shall be made with screwed socket couplings:				
6.1.3.1	160 mm dia	m	30		
6.1.3.2	110 mm dia	m	30		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
6.1.4	AIR VALVE CHAMBERS				

6.1.4.1.	Excavate for, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 800 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/HDPE pipes and fittings and valves in the pipeline junctions (Section valve chambers).				
	AIR VALVE CHAMBERS Fittings				
	160mm line				
6.1.4.2	160x 160x50 mm dia Reducing tee	No	1		
6.1.4.3	50mm dia Double acting air valve	No	1		
6.1.4.4	160mm dia double Double flange spigot 1000mm	No	2		
6.1.4.5	50 mm dia double flange gate valve	No	1		
6.1.4.6	50 mm dia, 0.5 m long flange GI spigot	No	2		
6.1.4.7	50 mm dia 2m long GI pipe	no	2		
6.1.4.8	160mm dia GI/HDPE adaptor	No.	6		
	110mm dia line				
6.1.4.9	110x 110x50 mm dia Reducing tee	No	1		
6.1.4.10	50 mm dia Double acting air valve	No	1		
6.1.4.11	110mm dia double flange spigot 1000mm	No	2		
6.1.4.12	50mm dia double flange gate valve	No	1		
6.1.4.13	50mm dia, 0.5 m long flange GI spigot	No	1		
6.1.4.14	50 mm dia 2m long GI pipe	no	1		
6.1.4.15	110mm dia GI/HDPE adaptor	No.	2		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

6.1.5.	WASH OUT VALVE CHAMBERS				
6.1.5.1	Excavate for, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1200 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/HDPE pipes and fittings and valves in the pipeline junctions (Section valve chambers).				
	160mm washout fittings				
6.1.5.2	160mm x 160x 50mm Flange Tee	No.	1		
6.1.5.3	160mm Double Flange sluice valve	No.	1		
6.1.5.4	160mm double spigot 1m	No.	2		
6.1.5.5	160mm GI/VJ flange adaptor	No.	2		
6.1.5.5	50mm dia HDPE PN8	m	2		
6.1.5.6	50mm GI/VJ flange adaptor	No	2		
	160mm washout fittings				
6.1.5.2	160mm x 160x 160mm Flange Tee	No.	1		
6.1.5.3	160mm Double Flange sluice valve	No.	1		
6.1.5.4	355mm double spigot 1m	No.	2		
6.1.5.5	355mm GI/VJ flange adaptor	No.	2		
6.1.5.5	160mm dia HDPE PN8	m	12		
6.1.5.6	160mm GI/VJ flange adaptor	No	2		
	110mm washout fittings				
6.1.5.7	110mm x 110x 50mm Flange Tee	No.	1		
6.1.5.8	50mm Double Flange sluice valve	No.	1		
6.1.5.9	160mm double spigot 1m	No.	2		
6.1.5.10	160mm GI/VJ flange adaptor	No.	2		

6.1.5.11	50mm dia HDPE PN8	m	12		
6.1.5.12	50mm GI/VJ flange adaptor	No	2		
6.1.6	BENDS				
	HDPE fittings (Vertical Bends)				
	11.25 deg				
6.1.6.1	160 mm dia	No.	2		
6.1.6.2	110mm dia	No.	2		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	GI fittings (Horizontal Bends)				
	11.25 deg				
6.1.6.3	160 mm dia	No.	2		
6.1.6.4	110mm dia	No.	1		
	22.5 deg				
6.1.6.6	160 mm dia	No.	1		
6.1.6.7	110mm dia	No.	2		
6.1.6	HDPE fittings (Reducer)				
6.1.6.1	160x110 mm dia.	No.	1		
6.1.7	10m³ Break Pressure Tank				
	THE FOLLOWING WORKS IN SUB SURFACE MASONRY BPT INCLUDING SUPPLY OF ALL MATERIALS AND NECESSARY WORKS FOR PLACING, ERECTING, COMPLETION, TESTING AND COMMISSIONING.				
6.1.7.1	Clear site of all bushes and shrubs and remove debris from site as directed by the Engineer	m ²	5		
6.1.7.2	Cut down trees not exceeding 500mm girth measured 1m from the ground level, grab out roots and dispose as directed	No.	3		

6.1.7.3	Excavate pit for BPT not exceeding 1.5m deep, store onsite and backfill with selected material and spread surplus onsite; including all necessary works for side protection and for keeping site free from water, mud and foreign material.	m ³	15		
6.1.7.4	Lay and compact 200mm thick hand-packed hardcore laid in layers not exceeding 150mm thick	m ²	15		
6.1.7.5	50mm thick blinding to receive base slab and treat surface with 'GLADIATOR' or another equal approved anti-termite treatment	m ²	12		
6.1.7.6	Reinforced Concrete 25/20 as 150mm thick floor slab	m ³	2		
6.1.7.7	Ditto: 100mm thick suspended slab	m ³	2		
6.1.7.8	Allow for finishing in cement/sand plaster (1:3) on roof slab laid in 2.5% fall	m ²	8		
6.1.7.9	Dressed stones (225x150) mm	m	122		
6.1.7.10	Reinforcement bars D8 dia.	kg	166		
6.1.7.11	Reinforcement bars D10 dia.	kg	148		
6.1.7.12	ERECT AND STRIKE SAWN FORMWORK TO: -				
6.1.7.13	Edges of 150mm thick floor slab	m	30		
6.1.7.14	soffit of suspended floor slab	m ²	20		
6.1.7.15	Edges of suspended roof slab 100mm thick	m	30		
6.1.7.16	Allow for forming 600mm x 600mm opening for access manhole in 100mm thick slab	No.	1		
6.1.8	BREAK PRESSURE TANK GI FITTINGS				
	INLET				
6.1.8.1	150mm dia. GI/uPVC adaptor	No.	1		
6.1.8.2	160mm dia. DF 90° bend	No.	2		
6.1.8.3	150mm Double flange 1700mm Spigot	No.	1		
6.1.8.4	150mm dia. Double Flange spigot 600mm (cut to suit on site)	No.	1		
6.1.8.5	VJ flanged adaptor 150mm dia.	No.	1		
6.1.8.6	160mm dia. Flange float valve	No.	1		
6.1.8.7	(600x 600) mm locable framed Access manhole cover	No.	1		
	OUTLET				
6.1.8.8	160mm flanged bell mouth	No.	1		
6.1.8.9	160mm flanged 90° bend	No.	1		
6.1.8.10	100mm diameter Double flanged spigot 3200mm long	No.	1		
6.1.8.11	160mm flanged adaptor	No.	1		
6.1.8.12	160mm flanged sluice valve	No.	1		
6.1.8.13	160mm flanged spigot 3000mm	No.	1		
6.1.8.14	160mm flanged adaptor	No.	1		
6.1.9	Overflow Pipework/Washout				
6.1.9.1	150mm dia. Flanged spigot 500mm long with a puddle flange 150mm from the sigot end	No	1		
6.1.9.2	150mm flange 90° bend	No	1		
6.1.9.3	150mm dia flange spigot pipe 500mm pipe	No	1		
6.1.9.4	150mm dia. Flange adaptor	No	1		
6.1.9.5	150mm dia double flange 45° bend	No	1		

6.1.9.6	150mm dia double flange spigot end bevelled (cut to suit site)	No	1		
	Washout				
6.1.9.7	100mm flange bell mouth	No	1		
6.1.9.8	100mm double flange 90° bend	No	1		
6.1.9.9	100mm double flange spigot pipe 2500mm	No	1		
6.1.9.10	100mm double flange sluice valve	No	1		
6.1.9.11	110mm uPVC pipe 3000mm long	No	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 6.2 - Main_2_ Karangi_Mbugiti Pipeline				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)
6.2.1	Excavation and Backfilling			
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.5 m unless otherwise specified			
6.2.1.1	Excavation and backfilling in normal material for Dia 315 mm pipe for depth n.e 1.0 m	m ³	2544	
6.2.1.2	Ditto 280 mm	m ³	140	
6.2.1.3	Ditto 250 mm	m ³	2058	
6.2.1.4	Ditto 200 mm	m ³	1416	
6.2.1.5	E.O for excavation in soft rock (provisional)	m ³	15	
	.			
6.2.1.6	E.O for excavation in hard rock (provisional)	m ³	15	
6.2.2	HDPE Pipe Work			
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.			
	Note: The following have been used on the drawings to specify pipe diameters/types/classes.			

	Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.			
	Class Working Pressure (m)			
	PN6 60			
	PN8 80			
	PN10 100			
	PN12.5 125			
	PN160 160			
	HDPE Straights			
	PN12.5			
6.2.2.1	315 mm dia	m	540	
6.2.2.2	315 mm dia	m	2640	
	PN8			
6.2.2.3	280 mm dia	m	180	
6.2.2.4	250mm dia	m	2940	
6.2.2.5	200mm dia	m	500	
	PN10			
6.2.2.6	200 mm dia	m	860	
	PN12.5			
6.2.2.7	200 mm dia.	m	260	
	PN16			
6.2.2.8	200 mm Dia.	m	100	
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE			
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE			
	GI Reducers			
	Provide, lay, joint and test GI Fittings(reducers)			
6.2.2.9	315 x 280mm dia Double flanged	No.	1	
6.2.2.10	315mm GI/HDPE adaptor	No.	1	
6.2.2.11	280mm GI/HDPE adaptor	No.	1	

6.2.2.12	280 x 250mm dia Double flanged	No.	1	
6.2.2.13	280mm GI/HDPE adaptor	No.	1	
6.2.2.14	250mm GI/HDPE adaptor	No.	1	
6.2.3	25m³ Break Pressure Tank			
	THE FOLLOWING WORKS IN SUB SURFACE MASONRY BPT INCLUDING SUPPLY OF ALL MATERIALS AND NECESSARY WORKS FOR PLACING, ERECTING, COMPLETION, TESTING AND COMMISSIONING.			
6.2.3.1	Clear site of all bushes and shrubs and remove debris from site as directed by the Engineer	m ²	2	
6.2.3.2	Cut down trees not exceeding 2.5m girth measured 1m from the ground level, grab out roots and dispose as directed	No.	4	
6.2.3.3	Excavate pit for BPT not exceeding 1.5m deep, store onsite and backfill with selected material and spread surplus onsite; including all necessary works for side protection and for keeping site free from water, mud and foreign material.	m ³	235	
6.2.3.4	Lay and compact 200mm thick hand-packed hardcore laid in layers no exceeding 150mm thick	m ²	6	
6.2.3.5	50mm thick blinding to receive base slab and treat surface with 'GLADIATOR' or another equal approved anti-termite treatment	m ²	157	
6.2.3.6	Reinforced Concrete 25/20 as 150mm thick floor slab	m ³	24	
6.2.3.7	Ditto: 100mm thick suspended slab	m ³	16	
6.2.3.8	Allow for finishing in cement/sand plaster (1:3) on roof slab laid in 2.5% fall	m ²	157	
6.2.3.9	Dressed stones (225x150) mm	No.	840	
6.2.3.10	Reinforcement bars D8 dia.	kg	379	
6.2.3.11	Reinforcement bars D10 dia.	kg	591	
	ERECT AND STRIKE SAWN FORMWORK TO:-			
6.2.4.12	Edges of 150mm thick floor slab	m	10	

6.2.4.13	soffit of suspended floor slab	m ²	79	
6.2.4.14	Edges of suspended roof slab 100mm thick	m	10	
6.2.3.15	Allow for forming 600mm x 600mm opening for access manhole in 100mm thick slab	No.	2	
	BREAK PRESSURE TANKS GI FITTINGS			
	INLET_1			
6.2.3.16	315mm dia. GI/plc. adaptor	No.	1	
6.2.3.17	315mm Double flange 2200mm Spigot	No.	1	
6.2.3.18	315mm dia. Double Flange spigot 600mm (cut to suit on site)	No.	1	
6.2.3.19	VJ flanged adaptor 315mm dia.	No.	1	
6.2.3.20	315mm dia. Flange float valve	No.	1	
6.2.3.21	(600x 600) mm locable framed Access manhole cover	No.	2	
	OUTLET_1			
6.2.3.22	280mm flanged bell mouth	No.	1	
6.2.3.23	280mm flanged 90° bend	No.	1	
6.2.3.24	280mm diameter Double flanged spigot 3200mm long	No.	1	
6.2.3.25	280mm flanged adaptor	No.	2	
6.2.3.26	280mm flanged sluice valve	No.	1	
6.2.3.27	280mm flanged spigot 3000mm	No.	1	
6.2.3.28	250mm flanged adaptor	No.	1	
	Overflow Pipework/Washout_1			
6.2.3.28	250mm dia. Flanged spigot 500mm long with a puddle flange 150mm from the spigot end	No.	1	
6.2.3.30	250mm flange 90° bend	No.	1	
6.2.3.31	250mm dia flange spigot pipe 500mm pipe	No.	1	
6.2.3.32	250mm dia. Flange adaptor	No.	1	

6.2.3.33	250mm dia double flange 45° bend	No.	1	
6.2.3.34	250mm dia double flange spigot end bevelled (cut to suit site)	No.	1	
6.2.3.35	160mm flanged bell mouth	No.	1	
6.2.3.36	160mm diameter Double flanged spigot 400mm long	No.	1	
6.2.3.37	160mm flanged 90° bend	No.	1	
	Washout_1			
6.2.3.37	250mm flange bell mouth	No.	1	
6.2.3.37	250mm double flange 90° bend	No.	1	
6.2.3.37	250mm double flange spigot pipe 2500mm	NO.	1	
6.2.3.37	250mm double flange sluice valve	No.	1	
6.2.3.37	250mm HDPE pipe 6000mm long	No.	1	
6.2.4	Air valves			
6.2.4.1	80mm Double acting flange air valve	No.	1	
6.2.4.2	315x315x80mm flange Tee	No.	1	
6.2.4.3	80mm flange gate valve	No.	1	
6.2.4.4	315mm 1000mm Double Flanged spigot	No.	2	
6.2.4.5	80mm Double flange spigot 300mm	No.	1	
	Air valves			
6.2.4.6	80mm Double acting flange air valve	No.	1	
6.2.4.7	280x280x80mm flangeTee	No.	1	
6.2.4.8	80mm flange gate valve	No.	1	
6.2.4.9	280mm 1000mm Double Flanged spigot	No.	2	
6.2.4.10	80mm Double flange spigot 300mm	No.	1	
	Air valves			
6.2.4.11	80mm Double acting flange air valve	No.	2	
6.2.4.12	250x250x80mm flangeTee	No.	2	

6.2.4.13	80mm flange gate valve	No.	2	
6.2.4.14	250mm 1000mm Double Flanged spigot	No.	4	
6.2.4.15	80mm Double flange spigot 300mm	No.	2	
	Air valves			
6.2.4.16	50mm Double acting flange air valve	No.	2	
6.2.4.17	250x200x50mm flangeTee	No.	1	
6.2.4.18	200x200x50mm flangeTee	No.	1	
6.2.4.19	50mm flange gate valve	No.	2	
6.2.4.20	200mm 1000mm Double Flanged spigot	No.	2	
6.2.4.21	200mm 1000mm Double Flanged spigot		2	
6.2.4.22	50mm Double flange spigot 300mm	No.	2	
6.2.5	WASH OUT CHAMBERS			
6.2.5.1	Excavate for, provide all materials and construct complete w/o chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	5	
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the specification			
	Wash Out			
6.2.5.2	280 / 280mm dia HDPE / Steel stepped coupling	No.	4	
6.2.5.3	280 mm dia x 1000mm double flanged GI pipe	No.	4	
6.2.5.4	280 mm x 280mm x 80mm GI tee flanged	No.	2	
6.2.5.5	80 mm dia flanged sluice valve	No.	2	
6.2.5.6	80 mm dia x 500 mm long single flanged GI pipe	No.	2	
6.2.5.7	80 / 90 mm dia HDPE / GI adaptor	No.	1	
6.2.5.8	90 mm HDPE pipe PN8	m	6	
	Wash Out at Chainages			

6.2.5.9	280 / 280mm dia HDPE / Steel stepped coupling	No.	2	
6.2.5.10	280 mm dia x 1000m double flanged GI pipe	No.	2	
6.2.5.11	280 mm x 280mm x 80mm GI tee flanged	No.	1	
6.2.5.12	80 mm dia flanged sluice valve	No.	1	
6.2.5.13	80 mm dia x 500 mm long single flanged GI pipe	No.	1	
6.2.5.14	80 / 90 mm dia HDPE / GI adaptor	No.	1	
	90 mm HDPE pipe PN8	m	6	
	Wash Out			
6.2.5.15	250 / 250mm dia HDPE / Steel stepped coupling	No.	6	
6.2.5.16	250 mm dia x 1000mm double flanged GI pipe	No.	6	
6.2.5.17	250 mm x 250mm x 80mm GI tee flanged	No.	3	
6.2.5.18	80 mm dia flanged sluice valve	No.	3	
6.2.5.19	80 mm dia x 500 mm long single flanged GI pipe	No.	3	
6.2.5.20	80 / 90 mm dia HDPE / GI adaptor	No.	3	
6.2.5.21	90 mm HDPE pipe PN8	m	18	
	Chamber for Main			
6.2.5.22	160 x 150mm dia flange adaptor	No	2	
6.2.5.23	160 mm dia, 1000mm long single flanged GI pipe	No	2	
6.2.5.24	100 x 80 mm dia flanged steel tee	No	1	
6.2.5.25	100 mm dia flanged sluice valve	No	1	
6.2.5.26	80 mm dia gate valve	No	1	
6.2.5.27	80 mm dia, 1000mm long single flanged GI pipe	No	1	
6.2.5.28	90 / 80 mm dia GI / HDPE adaptor	No	1	
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE			

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE			
6.2.6	BENDS			
	GI Fittings (Horizontal Bends)			
	11.25 deg			
6.2.6.1	315 mm dia	No.	1	
6.2.6.2	280 mm dia	No.	2	
6.2.6.3	250 mm dia	No.	2	
6.2.6.4	200 mm dia	No.	1	
	22.5 deg			
6.2.6.5	315mm dia	No.	4	
6.2.6.6	280 mm dia	No.	1	
	45 deg			
6.2.6.7	315 mm dia	No.	3	
	90 deg			
6.2.6.8	315mm dia	No.	1	
6.2.7	RIVER CROSSINGS FOR PIPES CHAINAGE			
	EXCAVATION			
	To include for all trimming to levels, backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement for anchor blocks and pipe encasement concrete			
6.2.7.1	In normal soil to a depth not exceeding 1.0 m.	m ³	16	
6.2.7.2	In murram/soft rock to a depth not exceeding 3 m.	m ³	8.4	
	CONCRETE WORKS			
	Provide and place the following concrete mixes including all form-work.			
6.2.7.3	50mm thick Concrete class 10 for blinding	m ²	8	

6.2.7.4	Mass Concrete class 20/20 for anchor blocks / pipe supports	m ³	12	
6.2.7.5	Mass concrete grade 20/20 for pipe encasement	m ³	6	
	Reinforcement			
	Provide support and fix the following reinforcement, including all cutting, bending and support for piers			
6.2.7.6	High yield bars	kg	640	
	PIPE WORKS			
6.2.7.7	280mm Steel double flange pipes	m	24	
6.2.7.8	250mm Steel double Flange pipes	m	27	
6.2.7.9	160mm Steel Double flange pipes	m	550	
6.2.7.10	Dia 280 mm double flanged bends	No.	4	
6.2.7.11	280/280 mm dia. single flanged adaptor	No.	4	
6.2.7.12	Dia 250 mm double flanged bends		12	
6.2.7.13	250/250 mm dia single flanged adaptor		12	
	PROTECTION WORKS			
6.2.7.14	Provide all materials, lay and place grouted rip rap (mortared stone pitching) 250 mm on sloping sides.	m ³	30	
	TOTAL CARRIED OVER TO COLLECTION SHEET			

Bill No 6.3- Main_3_Mbugiti Road Pipeline					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)
6.3.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.5 m unless otherwise specified				
6.3.1.1	Excavation and backfilling in normal material for Dia 180 mm pipe and 160mm for depth n.e 1.0 m	m ³	1984		
6.3.1.2	Ditto 110 mm	m ³	84		
6.3.1.3	Ditto 90 mm	m ³	126		
6.3.1.5	E.O for excavation in soft rock (provisional)	m ³	5		
6.3.1.6	E.O for excavation in hard rock (provisional)	m ³	5		
6.3.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN6 60				
	PN8 80				
	PN10 100				
	PN12.5 125				
	PN160 160				
	HDPE Straights				
	PN8				
6.3.2.1	160 mm dia	m	1740		
6.3.2.2	90 mm dia	m	358		
	PN10				
6.3.2.3	180 mm dia	m	120		

6.3.2.4	160 mm dia	m	740		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	GI Reducers				
	Provide, lay, joint and test GI Fittings(reducers)				
6.3.2.5	180 x 160mm dia Double flanged	No.	1		
6.3.2.6	180mm GI/HDPE adaptor	No.	1		
6.3.2.7	160mm GI/HDPE adaptor	No.	1		
6.3.2.8	160 x 90mm dia Double flanged	No.	1		
6.3.2.9	160mm GI/HDPE adaptor	No.	1		
6.3.2.10	90mm GI/HDPE adaptor	No.	1		
6.3.3	10m³ Break Pressure Tank				
	THE FOLLOWING WORKS IN SUB SURFACE MASONRY BPT INCLUDING SUPPLY OF ALL MATERIALS AND NECESSARY WORKS FOR PLACING, ERECTING, COMPLETION, TESTING AND COMMISSIONING.				
6.3.3.1	Clear site of all bushes and shrubs and remove debris from site as directed by the Engineer	m ²	5		
6.3.3.2	Cut down trees not exceeding 500mm girth measured 1m from the ground level, grab out roots and dispose as directed	No.	3		
6.3.3.3	Excavate pit for BPT not exceeding 1.5m deep, store onsite and backfill with selected material and spread surplus onsite; including all necessary works for side protection and for keeping site free from water, mud and foreign material.	m ³	15		
6.3.3.4	Lay and compact 200mm thick hand-packed hardcore laid in layers not exceeding 150mm thick	m ²	15		

6.3.3.5	50mm thick blinding to receive base slab and treat surface with 'GLADIATOR' or another equal approved anti-termite treatment	m ²	12		
6.3.3.6	Reinforced Concrete 25/20 as 150mm thick floor slab	m ³	2		
6.3.3.7	Ditto: 100mm thick suspended slab	m ³	2		
6.3.3.8	Allow for finishing in cement/sand plaster (1:3) on roof slab laid in 2.5% fall	m ²	8		
6.3.3.9	Dressed stones (225x150) mm	m	122		
6.3.3.10	Reinforcement bars D8 dia.	kg	166		
6.3.3.11	Reinforcement bars D10 dia.	kg	148		
6.3.3.12	ERECT AND STRIKE SAWN FORMWORK TO: -				
6.3.3.13	Edges of 150mm thick floor slab	m	30		
6.3.3.14	soffit of suspended floor slab	m ²	20		
6.3.3.15	Edges of suspended roof slab 100mm thick	m	30		
6.3.3.16	Allow for forming 600mm x 600mm opening for access manhole in 100mm thick slab	No.	1		
	BREAK PRESSURE TANK GI FITTINGS				
	INLET				
6.3.3.17	150mm dia. GI/uPVC adaptor	No.	1		
6.3.3.18	160mm dia. DF 90° bend	No.	2		
6.3.3.19	150mm Double flange 1700mm Spigot	No.	1		
6.3.3.20	150mm dia. Double Flange spigot 600mm (cut to suit on site)	No.	1		
6.3.3.21	VJ flanged adaptor 150mm dia.	No.	1		
6.3.3.22	160mm dia. Flange float valve	No.	1		
6.3.3.23	(600x 600) mm locable framed Access manhole cover	No.	1		
	OUTLET				
6.3.3.24	160mm flanged bell mouth	No.	1		
6.3.3.25	160mm flanged 90° bend	No.	1		
6.3.3.26	100mm diameter Double flanged spigot 3200mm long	No.	1		
6.3.3.27	160mm flanged adaptor	No.	1		
6.3.3.28	160mm flanged sluice valve	No.	1		
6.3.3.29	160mm flanged spigot 3000mm	No.	1		
6.3.3.30	160mm flanged adaptor	No.	1		
	Overflow Pipework/Washout				
6.3.3.31	150mm dia. Flanged spigot 500mm long with a puddle flange 150mm from the sigot end	No	1		
6.3.3.32	150mm flange 90° bend	No	1		
6.3.3.33	150mm dia flange spigot pipe 500mm pipe	No	1		
6.3.3.34	150mm dia. Flange adaptor	No	1		
6.3.3.35	150mm dia double flange 45° bend	No	1		
6.3.3.36	150mm dia double flange spigot end bevelled (cut to suit site)	No	1		

	Washout				
6.3.3.37	100mm flange bell mouth	No	1		
6.3.3.38	100mm double flange 90° bend	No	1		
6.3.3.39	100mm double flange spigot pipe 2500mm	No	1		
6.3.3.40	100mm double flange sluice valve	No	1		
6.3.3.41	110mm uPVC pipe 3000mm long	No	1		
6.3.4	Air valves				
6.3.4.1	50mm Double acting flange air valve	No.	1		
6.3.4.2	160x160x50mm flangeTee	No.	1		
6.3.4.3	50mm flange gate valve	No.	1		
6.3.4.4	160mm 1000mm Double Flanged spigot	No.	2		
6.3.4.5	50mm Double flange spigot 300mm	No.	1		
	Air valves				
6.3.4.6	50mm Double acting flange air valve	No.	1		
6.3.4.7	90x90x50mm flangeTee	No.	1		
6.3.4.8	50mm flange gate valve	No.	1		
6.3.4.9	90mm 1000mm Double Flanged spigot	No.	2		
6.3.4.10	50mm Double flange spigot 300mm	No.	1		
6.3.5	WASH OUT CHAMBERS				
6.3.5.1	Excavate for, provide all materials and construct complete w/o chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	5		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the specification				
	Wash Out				
6.3.5.2	90/ 90mm dia HDPE / Steel stepped coupling	No.	4		
6.3.5.3	90 mm dia x 1000mm double flanged GI pipe	No.	4		

6.3.5.4	90 mm x 90mm x 50mm GI tee flanged	No.	2		
6.3.5.5	50 mm dia flanged sluice valve	No.	2		
6.3.5.6	50 mm dia x 500 mm long single flanged GI pipe	No.	2		
6.3.5.7	50 / 90 mm dia HDPE / GI adaptor	No.	1		
6.3.5.8	75 mm HDPE pipe PN8	m	6		
	Wash Out at Chainages				
6.3.5.9	160 / 160mm dia HDPE / Steel stepped coupling	No.	2		
6.3.5.10	160mm dia x 1000m double flanged GI pipe	No.	2		
6.3.5.11	160 mm x 160mm x 50mm GI tee flanged	No.	1		
6.3.5.12	50 mm dia flanged sluice valve	No.	1		
6.3.5.13	50 mm dia x 500 mm long single flanged GI pipe	No.	1		
6.3.5.14	80 / 90 mm dia HDPE / GI adaptor	No.	1		
6.3.5.15	75 mm HDPE pipe PN8	m	6		
	Wash Out				
6.3.5.16	250 / 250mm dia HDPE / Steel stepped coupling	No.	6		
6.3.5.17	250 mm dia x 1000mm double flanged GI pipe	No.	6		
6.3.5.18	250 mm x 250mm x 80mm GI tee flanged	No.	3		
6.3.5.19	80 mm dia flanged sluice valve	No.	3		
6.3.5.20	80 mm dia x 500 mm long single flanged GI pipe	No.	3		
6.3.5.21	80 / 90 mm dia HDPE / GI adaptor	No.	3		
6.3.5.22	90 mm HDPE pipe PN8	m	18		
6.3.6	Chamber for Main				
6.3.6.23	280 x 280mm dia flange adaptor	No	2		

6.3.6.24	280mm dia, 1000mm long single flanged GI pipe	No	2		
6.3.6.25	280x 280 mm dia flanged steel tee	No	1		
6.3.6.26	160 mm dia flanged sluice valve	No	1		
6.3.6.15	160 mm dia, 1000mm long single flanged GI pipe	No	1		
6.3.6.16	90 / 80 mm dia GI / HDPE adaptor	No	1		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
6.3.7	BENDS				
	GI Fittings (Horizontal Bends)				
	11.25 deg				
6.3.7.1	160mm dia	No.	1		
6.3.7.2	90 mm dia	No.	2		
	22.5 deg				
6.3.7.5	160mm dia	No.	4		
6.3.7.6	90 mm dia	No.	1		
	45 deg				
6.3.7.7	160 mm dia	No.	3		
	90 deg				
6.3.7.8	160mm dia	No.	1		
6.3.8	RIVER CROSSINGS FOR PIPES CHAINAGE				
	EXCAVATION				

	To include for all trimming to levels, backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement for anchor blocks and pipe encasement concrete				
6.3.8.1	In normal soil to a depth not exceeding 1.0 m.	m ³	16		
6.3.8.2	In murrum/soft rock to a depth not exceeding 3 m.	m ³	8.4		
	CONCRETE WORKS				
	Provide and place the following concrete mixes including all form-work.				
6.3.8.3	50mm thick Concrete class 10 for blinding	m ²	8		
6.3.8.4	Mass Concrete class 20/20 for anchor blocks / pipe supports	m ³	12		
6.3.8.5	Mass concrete grade 20/20 for pipe encasement	m ³	6		
	Reinforcement				
	Provide support and fix the following reinforcement, including all cutting, bending and support for piers				
6.3.8.6	High yield bars	kg	640		
	PIPE WORKS				
6.3.8.7	160mm Steel double flange pipes	m	24		
6.3.8.8	90mm Steel double Flange pipes	m	27		
6.3.8.9	160mm Steel Double flange pipes	m	550		
	PROTECTION WORKS				
6.3.8.10	Provide all materials, lay and place grouted rip rap (mortared stone pitching) 250 mm on sloping sides.	m ³	10		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

	DESCRIPTION	AMOUNT (KSh)
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ITEM NO.		
	COLLECTION	
7.1	Submain Forest Station	
7.2	Submain Tosha	
7.3	Submain Rokabi	
7.4	Submain Pluto A	
7.5	Submain Pluto B	
7.6	Submain Munga	
7.7	Submain Mwendia	
7.8	Submain Ndamiyu	
7.9	Submain Ndambia	
7.10	Submain Kimandia_RD	
7.11	Murachuri	
7.12	Gituamba	
7.13	Submain Mitati	
7.14	Submain Nguchita	
7.15	Mary	
7.16	Mahii-ini	
7.17	Submain Gatambia	
7.18	Wandibe	
7.19	Githaite A	
7.20	Githaite B	
7.21	Githaite C	
7.22	Mokore	
7.23	Kabiru	
7.24	Muya	

7.25	Mugaki	
7.26	Githinji	
7.27	Waiganjo	
7.28	Gatitu	
7.29	Kagunda	
7.30	Kahuhu	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

Bill No 7.1 - SM 1 -Forest Station 170M					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.1.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.1.1.1	Excavation and backfilling in normal material for Dia 75 mm pipe for depth n.e 1.0 m	m ³	60		
7.1.1.3	E.O for excavation in soft rock (provisional)	m ³	1		
7.1.1.4	E.O for excavation in hard rock (provisional)	m ³	1		
7.1.2	HDPE Pipe Work				

	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN8				
7.1.2.1	75mm dia	m	650		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.1.3	OFFTAKE CHAMBER				
7.1.3.1	Excavate for, provide all materials and construct complete air valve chambers. Internal dimensions 1500 x 1500 x 1500 mm. Rates to include for all thrust blocks, pipe supports, inspection covers, etc. as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for				

	completing all pipe joints as specified in the specification				
	FITTINGS				
7.1.3.2	355 / 355mm dia PVC U/Steel coupling	No.	2		
7.1.3.3	355mm dia x 1000mm double flanged GI pipe	No.	2		
7.1.3.4	355x355 mm x 75 mm flanged GI tee	No.	1		
7.1.3.5	75mm dia flanged sluice valve	No.	7		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.2- SM 2-Tosha 1310m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.2.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.2.1.1	Excavation and backfilling in normal material for Dia 63 mm pipe for depth n.e 1.0 m	m ³	459		
7.2.1.2	E.O for excavation in soft rock (provisional)	m ³	2		

7.2.1.3	E.O for excavation in hard rock (provisional)	m ³	2		
7.2.2	HDPE Pipe Work				
7.2.2.1	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN16				
7.2.2.2	63mm dia	m	1310		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.3.3	OFFTAKE CHAMBER				
7.3.3.1	Excavate for, provide all materials and construct complete air valve chambers. Internal dimensions 1200 x 1200 x 1200 mm. Rates to include for all thrust blocks, pipe supports, inspection covers, etc. as detailed in the drawings.	No.	1		

	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the specification				
	FITTINGS				
7.3.3.2	160 / 160mm dia. HDPE U/Steel coupling	No.	2		
7.3.3.3	16mm dia x 1000mm double flanged GI pipe	No.	2		
7.3.3.4	160x160 mm x 63 mm flanged GI tee	No.	1		
7.3.3.5	63mm dia flanged sluice valve	No.	7		
7.3.4	BENDS				
	HDPE fittings (Vertical Bends)				
	11.25 deg				
7.3.6.1	63 mm dia	No.	1		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
6.1.7	HDPE fittings (Horizontal Bends)				
	11.25 deg				
6.1.7.1	63 mm dia	No.	2		
	22.5 deg				
6.1.6.6	63 mm dia	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.3- SM 3-Rokabi_1400m				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
6.1.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
6.1.1.1	Excavation and backfilling in normal material for Dia 110& 75mm pipe for depth n.e 1.0 m	m ³	199		
6.1.1.3	E.O for excavation in soft rock (provisional)	m ³	2		
6.1.1.4	E.O for excavation in hard rock (provisional)	m ³	2		
6.1.2	HDPE Pipe Work				
6.1.2.1	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN8				
6.1.2.4	110mm dia	m	360		
6.1.2.4	75mm dia	m	1040		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	GI/HDPE FITTINGS				
6.1.4.7	Reducer Coupling 110x75mm	No.	1		
6.1.5	Offtake valve chamber				
6.1.5.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
6.1.5.2	75 /75mm dia flanged adaptor	No.	3		
6.1.5.3	75 mm dia, 1000mm long double flanged GI pipe	No.	2		
6.1.5.4	75 mm dia flanged sluice valve	No.	2		
6.1.5.5	75x75x75mm dia GI Tee	No.	1		
6.1.6	BENDS				
	HDPE fittings (Vertical Bends)				
	11.25 deg				
6.1.6.1	75 mm dia	No.	1		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	HDPE fittings (Horizontal Bends)				
	11.25 deg				
6.1.6.3	75 mm dia	No.	2		
	22.5 deg				
6.1.6.6	75 mm dia	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.4 - SM 4-Pluto A 1126m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.4.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.4.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	450		
7.4.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.4.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.4.2	HDPE Pipe Work				

	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN8				
7.4.3.1	75mm dia	m	860		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN10				
7.4.3.2	75mm dia	m	100		
	PN12.5				
7.4.3.3	75mm dia	m	166		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.4.1	Offtake valve chamber				

7.4.1.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings For Chamber				
7.4.1.2	75 /75mm dia flanged adaptor	No.	3		
7.4.1.3	75 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.4.1.4	75 mm dia flanged sluice valve	No.	2		
7.4.1.5	75x75x75mm dia GI Tee	No.	1		
	HDPE fittings (Horizontal Bends)				
	11.25 deg				
7.4.3.6	75mm dia	No.	1		
	22.5 deg				
7.4.3.7	75mm dia	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.5 - SM 5-Pluto B					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.4.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth				

	of excavation not exceeding 1.0 m unless otherwise specified				
7.4.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	260		
7.4.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.4.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.4.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN10				
7.4.3.2	75mm dia	m	651		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
6.1.5	Offtake valve chamber				
6.1.5.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings For Chamber				
6.1.5.2	75 /75mm dia flanged adaptor	No.	3		
6.1.5.3	75 mm dia, 1000mm long double flanged GI pipe	No.	2		
6.1.5.4	75 mm dia flanged sluice valve	No.	2		
6.1.5.5	75x75x75mm dia GI Tee	No.	1		
	HDPE fittings (Horizontal Bends)				
	11.25 deg				
7.4.3.4	75mm dia	No.	1		
	22.5 deg				
7.4.3.5	75mm dia	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.6 - SM 6-Munga 392m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.6.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.6.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	137		
7.6.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.6.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.6.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.6.2.1	40mm dia	m	392		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.6.3	Offtake valve chamber				
7.6.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.6.3.2	315 /315mm dia flanged adaptor	No.	2		
7.6.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.6.3.4	40 mm dia flanged sluice valve	No.	1		
7.6.3.5	315x315x40mm dia GI Tee	No.	1		
7.6.3.5	40 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.7 - SM 7-Mwendia-877					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)

7.7.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.7.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	307		
7.7.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.7.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.7.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.7.2.1	50mm dia	m	877		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.7.3	Offtake valve chamber				
7.7.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.7.3.2	315 /315mm dia flanged adaptor	No.	2		
7.7.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.7.3.4	50 mm dia flanged sluice valve	No.	1		
7.7.3.5	315x315x50mm dia GI Tee	No.	1		
7.7.3.5	50 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.8 - SM 8-Ndamaiyu_169m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.8.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.8.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	59		
7.8.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.8.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.8.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.8.2.1	50mm dia	m	169		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.8.3	Offtake valve chamber				
7.8.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.8.3.2	315 /315mm dia flanged adaptor	No.	2		
7.8.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.8.3.4	50 mm dia flanged sluice valve	No.	1		
7.6.3.5	315x315x50mm dia GI Tee	No.	1		
7.8.3.5	50 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.9 - SM 9-Ndambia_563m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.9.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.91.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	197		
7.9.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.9.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.9.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.9.2.1	63mm dia	m	169		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.9.3	Offtake valve chamber				
7.9.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.9.3.2	315 /315mm dia flanged adaptor	No.	2		
7.9.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.9.3.4	63 mm dia flanged sluice valve	No.	1		
7.9.3.5	315x315x63mm dia GI Tee	No.	1		
7.9.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.10 - SM 10-Ndambia_563m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.10.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.10.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	491		
7.10.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.10.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.10.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.6.2.1	63mm dia	m	1402		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.10.3	Offtake valve chamber				
7.10.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.10.3.2	315 /315mm dia flanged adaptor	No.	2		
7.10.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.10.3.4	63 mm dia flanged sluice valve	No.	1		
7.10.3.5	315x315x63mm dia GI Tee	No.	1		
7.10.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.11 - SM 11-Murachuri-					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.11.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth				

	of excavation not exceeding 1.0 m unless otherwise specified				
7.11.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	217		
7.11.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.11.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.11.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.11.2.1	50mm dia	m	620		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.11.3	Offtake valve chamber				
7.11.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.11.3.2	63 /63mm dia flanged adaptor	No.	2		
7.11.3.3	63 mm dia, 1000mm long	No.	2		
7.11.3.4	50 mm dia flanged sluice valve	No.	1		
7.11.3.5	63x63x63mm dia hdpe Tee	No.	1		
7.11.3.5	50 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.11 - SM 11-Ndambia					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.11.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation				

	not exceeding 1.0 m unless otherwise specified				
7.11.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	301		
7.11.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.11.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.11.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.11.2.1	75mm dia	m	320		
7.11.2.1	63mm dia	m	420		

	PN10				
7.11.2.1	63mm dia	m	122		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.11.3	Offtake valve chamber				
7.11.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.11.3.2	315/315mm dia flanged adaptor	No.	2		
7.11.3.3	315 mm dia, 1000mm long	No.	2		
7.11.3.4	75mm dia flanged sluice valve	No.	1		
7.11.3.5	315x315x75mm dia hdpe Tee	No.	1		
7.11.3.5	75 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.13- SM13-Mitati 1647m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.13.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.13.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	583		
7.13.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.13.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.13.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.13.2.1	40mm dia	m	1080		
	PN10				
7.13.2.2	40mm dia	m	180		

	PN12.5				
7.13.2.3	40mm dia	m	200		
	PN16				
7.13.2.4	40mm dia	m	187		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.13.3	Offtake valve chamber				
7.13.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.13.3.2	63 /63mm dia flanged adaptor	No.	2		
7.13.3.3	63mm dia, 1000mm long double flanged GI pipe	No.	2		
7.13.3.4	40 mm dia flanged sluice valve	No.	1		
7.13.3.5	63x63x40mm dia GI Tee	No.	1		
7.13.3.5	40 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.14- SM 14-Nguchita				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.14.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.14.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	138		
7.14.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.14.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.14.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.14.2.1	50mm dia	m	398		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.14.3	Offtake valve chamber				
7.14.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.14.3.2	315 /315mm dia flanged adaptor	No.	2		
7.14.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.14.3.4	50 mm dia flanged sluice valve	No.	1		
7.14.3.5	315x315x50mm dia GI Tee	No.	1		
7.14.3.5	50 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.15- SM 15-MARY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.15.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.15.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	117		
7.15.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.15.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.15.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN10				
7.15.2.1	32mm dia	m	335		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.15.3	Offtake valve chamber				
7.15.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.15.3.2	315 /315mm dia flanged adaptor	No.	2		
7.15.3.3	315 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.15.3.4	32 mm dia flanged sluice valve	No.	1		
7.15.3.5	315x315x50mm dia GI Tee	No.	1		
7.15.3.5	32 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.16. - SM 16-Mahii-ini-520m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.16.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.16.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	182		
7.16.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.16.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.16.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 10				
7.11.2.1	63mm dia	m	460		
	PN 12.5				
7.11.2.1	63mm dia	m	60		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.11.3	Offtake valve chamber				
7.11.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.11.3.2	315/315mm dia flanged adaptor	No.	2		
7.11.3.3	315 mm dia, 1000mm long	No.	2		
7.11.3.4	63mm dia flanged sluice valve	No.	1		
7.11.3.5	315x315x63mm dia hdpe Tee	No.	1		
7.11.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.17. - SM 17-Gatabia-520m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.17.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				

7.17.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	182		
7.17.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.17.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.17.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 8				
7.17.2.1	63mm dia	m	280		
	PN 10				
7.17.2.1	63mm dia	m	60		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				

7.17.3	Offtake valve chamber				
7.17.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.17.3.2	315/315mm dia flanged adaptor	No.	2		
7.17.3.3	315 mm dia, 1000mm long	No.	2		
7.17.3.4	63mm dia flanged sluice valve	No.	1		
7.17.3.5	315x315x63mm dia hdpe Tee	No.	1		
7.17.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.18 - SM 18-Wandibe_1940m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.18.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				

7.18.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	679		
7.18.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.18.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.18.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 8				
7.18.2.1	90mm dia	m	1880		
	PN 10				
7.182.1	90mm dia	m	60		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				

7.18.3	Offtake valve chamber				
7.18.3.1	Excavate for, provide all materials and construct complete Valve chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.18.3.2	280/280mm dia flanged adaptor	No.	2		
7.18.3.3	280 mm dia, 1000mm long	No.	2		
7.18.3.4	90mm dia flanged sluice valve	No.	1		
7.18.3.5	280x280x90mm dia Tee	No.	1		
7.18.3.5	90mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.19. - SM 19-Gethaite-783m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.19.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				

7.19.1.1	Excavation and backfilling in normal material for Dia 63mm pipe for depth n.e 1.0 m	m ³	274		
7.19.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.19.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.19.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 8				
7.19.2.1	63mm dia	m	220		
	PN 10				
7.19.2.1	63mm dia	m	563		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				

7.19.3	Offtake valve chamber				
7.19.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.19.3.2	160/160mm dia flanged adaptor	No.	2		
7.19.3.3	160mm dia, 1000mm long	No.	2		
7.19.3.4	63mm dia flanged sluice valve	No.	1		
7.19.3.5	160x160x63mm dia hdpe Tee	No.	1		
7.19.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.20 - SM 20-Githaiti-B-580					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.20.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				

7.20.1.1	Excavation and backfilling in normal material for Dia 50mm pipe for depth n.e 1.0 m	m ³	203		
7.20.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.20.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.20.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN10				
7.20.2.1	50mm dia	m	300		
	PN12.5				
7.20.2.1	50mm dia	m	280		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.20.3	Offtake valve chamber				
7.20.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.20.3.2	160 /160mm dia flanged adaptor	No.	2		
7.20.3.3	160 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.20.3.4	50 mm dia flanged sluice valve	No.	1		
7.20.3.5	160x160x50mm dia GI Tee	No.	1		
7.20.3.5	50 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.21- SM 21-Githaiti-C 274m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.21.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth				

	of excavation not exceeding 1.0 m unless otherwise specified				
7.21.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	96		
7.21.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.21.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.21.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN12.5				
7.21.2.2	40mm dia	m	274		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				

	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.21.3	Offtake valve chamber				
7.21.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.21.3.2	160 /160mm dia flanged adaptor	No.	2		
7.21.3.3	160mm dia, 1000mm long double flanged GI pipe	No.	2		
7.21.3.4	40 mm dia flanged sluice valve	No.	1		
7.21.3.5	160x160x40mm dia GI Tee	No.	1		
7.21.3.6	40 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.22- SM22-Mokore_2820m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
6.22.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the				

	specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
6.22.1.1	Excavation and backfilling in normal material for Dia 110& 75mm pipe for depth n.e 1.0 m	m ³	1354		
6.22.1.2	E.O for excavation in soft rock (provisional)	m ³	2		
6.22.1.3	E.O for excavation in hard rock (provisional)	m ³	2		
6.22.2	HDPE Pipe Work				
6.22.2.1	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	PN8				
6.22.2.2	110mm dia	m	1720		
	PN12.5				
6.22.2.3	110mm dia	m	1100		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
6.22.3	Offtake valve chamber				
6.22.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
6.22.3.2	160 /160mm dia flanged adaptor	No.	3		
6.22.3.3	160 mm dia, 1000mm long double flanged GI pipe	No.	2		
6.22.3.4	110 mm dia flanged sluice valve	No.	2		
6.22.3.5	160x160x110mm dia GI Tee	No.	1		
6.1.6.1	110 mm dia	No.	1		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	HDPE fittings (Horizontal Bends)				
	11.25 deg				
6.1.6.3	110mm dia	No.	2		
	22.5 deg				
6.1.6.6	110 mm dia	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.23 - SM 23-Kabiru-400m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.23.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.23.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	140		
7.23.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.23.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.23.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				

	PN8				
7.23.2.1	63mm dia	m	180		
	PN10				
7.23.2.2	63mm dia	m	120		
	PN12.5				
7.23.2.3	63mm dia	m	100		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.23.3	Offtake valve chamber				
7.23.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.23.3.2	110/110mm dia flanged adaptor	No.	2		
7.23.3.3	110 mm dia, 1000mm long	No.	2		
7.23.3.4	63mm dia flanged sluice valve	No.	1		
7.23.3.5	110x110x63mm dia GI Tee	No.	1		
7.23.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.24- SM 24-Muya-620m				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.24.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.24.1.1	Excavation and backfilling in normal material for Dia 40mm pipe for depth n.e 1.0 m	m ³	217		
7.24.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.24.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.24.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				

7.24.2.1	40mm dia	m	620		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.13.3	Offtake valve chamber				
7.13.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.13.3.2	250 /250mm dia flanged adaptor	No.	2		
7.13.3.3	250mm dia, 1000mm long double flanged GI pipe	No.	2		
7.13.3.4	40 mm dia flanged sluice valve	No.	1		
7.13.3.5	250x250x40mm dia GI Tee	No.	1		
7.13.3.5	40 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.25- SM 25-Mugakii 2640m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.25.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.25.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	924		
7.25.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.25.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.25.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.13.2.1	75mm dia	m	2040		
	PN10				
7.13.2.2	75mm dia	m	280		

	PN12.5				
7.13.2.3	75mm dia	m	180		
7.13.2.4	63mm dia	m	140		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.13.3	Offtake valve chamber				
7.13.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.13.3.2	250 /250mm dia flanged adaptor	No.	2		
7.13.3.3	250mm dia, 1000mm long double flanged GI pipe	No.	2		
7.13.3.4	75 mm dia flanged sluice valve	No.	1		
7.13.3.5	250x250x75mm dia GI Tee	No.	1		
7.13.3.5	75 mm dia, 1000mm long double flanged GI pipe	No.	1		
	HDPE fittings (Horizontal Bends)				
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.26. - SM 26-Githinji-533m				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.26.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.26.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	187		
7.26.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.26.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.26.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 8				

7.26.2.1	63mm dia	m	280		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.26.3	Offtake valve chamber				
7.26.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.26.3.2	75/75mm dia flanged adaptor	No.	2		
7.26.3.3	75mm dia, 1000mm long	No.	2		
7.26.3.4	63mm dia flanged sluice valve	No.	1		
7.26.3.5	75x75x75mm dia hdpe Tee	No.	1		
7.26.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.27 - SM 27-Waiganjo_1281m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.26.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.26.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	448		
7.26.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.26.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.26.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.26.2.1	63mm dia	m	440		
	PN10				
7.26.2.1	63mm dia	m	1402		

	PN12.5				
7.26.2.1	63mm dia	m	1402		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.26.3	Offtake valve chamber				
7.26.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.26.3.2	250 /250mm dia flanged adaptor	No.	2		
7.26.3.3	250 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.26.3.4	63 mm dia flanged sluice valve	No.	1		
7.26.3.5	250x200x63mm dia GI Tee	No.	1		
7.26.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.28 - SM 28-Gatitu_1640m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.26.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.26.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	574		
7.26.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.26.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.26.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN8				
7.26.2.1	63mm dia	m	100		
	PN10				
7.26.2.1	63mm dia	m	820		

	PN12.5				
7.26.2.1	63mm dia	m	720		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.26.3	Offtake valve chamber				
7.26.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1500 x 1500 x 1500 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.26.3.2	200 /200mm dia flanged adaptor	No.	2		
7.26.3.3	200 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.26.3.4	63 mm dia flanged sluice valve	No.	1		
7.26.3.5	200x200x63mm dia GI Tee	No.	1		
7.26.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.29. - SM 29-Kagunda-688m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)
7.29.1	Excavation and Backfilling				

	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.29.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	241		
7.29.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.29.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.29.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN 12.5				
7.29.2.1	90mm dia	m	280		

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.29.3	Offtake valve chamber				
7.29.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.29.3.2	200/200mm dia flanged adaptor	No.	2		
7.29.3.3	200mm dia, 1000mm long	No.	2		
7.29.3.4	90mm dia flanged sluice valve	No.	1		
7.29.3.5	200x200x90mm dia GI Tee	No.	1		
7.29.3.5	90 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No 7.30 - SM 30-Kahugu_1920m					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (KSh)

7.30.1	Excavation and Backfilling				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
7.30.1.1	Excavation and backfilling in normal material for Dia 75mm pipe for depth n.e 1.0 m	m ³	322		
7.30.1.2	E.O for excavation in soft rock (provisional)	m ³	1		
7.30.1.3	E.O for excavation in hard rock (provisional)	m ³	1		
7.30.2	HDPE Pipe Work				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointly materials, cutting wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	PN 6 60				
	PN 8 100				
	PN 10 125				
	PN 16 160				
	HDPE Straights				

	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
	PN12.5				
7.30.2.1	63mm dia	m	920		
	SUB-TOTAL CARRIED FORWARD TO NEXT PAGE				
	SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE				
7.30.3	Offtake valve chamber				
7.30.3.1	Excavate for, provide all materials and construct complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	1		
	Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	Fittings for Chamber				
7.30.3.2	200 /200mm dia flanged adaptor	No.	2		

7.30.3.3	200 mm dia, 1000mm long double flanged GI pipe	No.	2		
7.30.3.4	63 mm dia flanged sluice valve	No.	1		
7.30.3.5	200x200x63mm dia GI Tee	No.	1		
7.30.3.5	63 mm dia, 1000mm long double flanged GI pipe	No.	1		
	TOTAL CARRIED OVER TO COLLECTION SHEET				

Bill No. 8.0 Mbugiti In-Field System					
ITEM	DESCRIPTION	UNIT	QUANTIT Y	RATE (KSh)	AMOUNT (KSh)
8.1	Plots (1058Nos.)				
8.1.1	20/20 mm dia uPVC/GI adaptor	No.	1058		
8.1.2	20 mm dia GI nipple	No.	1058		
8.1.3	20 mm dia gate valve	No.	1058		
8.2	individual Sandle clamps				
8.2.1	20mm dia HDPE pipe	m	21160		
8.2.2	20/20mm dia HDPE / GI Adapter	No.	1058		
8.2.3	Sandle clamps	No.	1058		

	TOTAL CARRIED OVER TO COLLECTION SHEET				

PART III - CONDITIONS OF CONTRACT AND CONTRACT FORMS

These General Conditions of Contract (GCC), read in conjunction with the Special Conditions of Contract (SCC) and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

These General Conditions of Contract have been developed on the basis of considerable international experience in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

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

General Conditions of Contract

A. General

1. Definitions

1.1 Bold face type is used to identify defined terms.

- a) **The Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
- b) **The Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.
- c) **The Adjudicator** is the person appointed jointly by the Procuring Entity and the Contractor to resolve disputes in the first instance, as provided for in GCC 23.
- d) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid.
- e) **Compensation Events** are those defined in GCC Clause 42 hereunder.
- f) **The Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 53.1.
- g) **The Contract** is the Contract between the Procuring Entity and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.
- h) **The Contractor** is the party whose Bid to carry out the Works has been accepted by the Procuring Entity.
- i) **The Contractor's Bid** is the completed bidding document submitted by the Contractor to the Procuring Entity.
- j) **The Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.
- k) **Days** are calendar days; months are calendar months.
- l) **Day works** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.
- m) **A Defect** is any part of the Works not completed in accordance with the Contract.

- n) **The Defects** Liability Certificate is the certificate issued by Project Manager upon correction of defects by the Contractor.
- o) **The Defects Liability Period** is the period **named in the SCC** pursuant to Sub-Clause 34.1 and calculated from the Completion Date.
- p) **Drawings** means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Procuring Entity in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.
- q) **The Procuring Entity** is the party who employs the Contractor to carry out the Works, **as specified in the SCC**, who is also the Procuring Entity.
- r) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.
- s) **"In writing" or "written"** means hand-written, type-written, printed or electronically made, and resulting in a permanent record;
- t) The Initial Contract Price is the Contract Price listed in the Procuring Entity's Letter of Acceptance.
- u) **The Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is **specified in the SCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.
- v) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- w) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
- x) **The Project Manager** is the person **named in the SCC** (or any other competent person appointed by the Procuring Entity and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.
- y) **SCC** means Special Conditions of Contract.
- z) **The Site** is the area of the works as **defined as such in the SCC**.
- aa) **Site Investigation Reports** are those that were included in the bidding document and are factual and interpretative reports about the surface and subsurface conditions at the Site.
- bb) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.
- cc) **The Start Date** is **given in the SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.
- dd) **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.
- ee) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.
- ff) **A Variation** is an instruction given by the Project Manager which varies the Works.

gg) **The Works** are what the Contract requires the Contractor to construct, install, and turn over to the Procuring Entity, **as defined in the SCC**.

2. Interpretation

- 2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.
- 2.2 If sectional completion is specified in the SCC, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).
- 2.3 The documents forming the Contract shall be interpreted in the following order of priority:
 - a) Agreement,
 - b) Letter of Acceptance,
 - c) Contractor's Bid,
 - d) Special Conditions of Contract,
 - e) General Conditions of Contract, including Appendices,
 - f) Specifications,
 - g) Drawings,
 - h) Bill of Quantities, and
 - i) any other document **listed in the SCC** as forming part of the Contract.

3. Language and Law

- 3.1 The language of the Contract is English Language and the law governing the Contract are the Laws of Kenya.
- 3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Procuring Entity's Country when
 - a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country; or
 - b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

4. Project Manager's Decisions

- 4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Procuring Entity and the Contractor in the role representing the Procuring Entity.

5. Delegation

- 5.1 Otherwise **specified in the SCC**, the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

- 6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

- 7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Procuring Entity in writing. Subcontracting shall not alter the Contractor's obligations.

8. Other Contractors

- 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Procuring Entity between the dates given in the Schedule of Other Contractors, as **referred to in the SCC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Procuring Entity may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel and Equipment

- 9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
- 9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.
- 9.3 If the Procuring Entity, Project Manager or Contractor determines, that any employee of the Contractor be determined to have engaged in Fraud and Corruption during the execution of the Works, then that employee shall be removed in accordance with Clause 9.2 above.

10. Procuring Entity's and Contractor's Risks

- 10.1 The Procuring Entity carries the risks which this Contract states are Procuring Entity's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Procuring Entity's Risks

11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Procuring Entity's risks:

- a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to
 - i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or
 - ii) negligence, breach of statutory duty, or interference with any legal right by the Procuring Entity or by any person employed by or contracted to him except the Contractor.
- b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is a Procuring Entity's risk except loss or damage due to

- aa) a Defect which existed on the Completion Date, bb) an event occurring before the Completion Date, which was not itself a Procuring Entity's risk, or
- cc) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

12.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Procuring Entity's risks are Contractor's risks.

13. Insurance

13.1 The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the SCC** for the following events which are due to the Contractor's risks:

- a) loss of or damage to the Works, Plant, and Materials;
- b) loss of or damage to Equipment;
- c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
- d) personal injury or death.

13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

13.3 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may affect the insurance which the Contractor should have provided and recover the premiums the Procuring Entity has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Data

14.1 The Contractor shall be deemed to have examined any Site Data **referred to in the SCC**, supplemented by any information available to the Contractor.

15. Contractor to Construct the Works

15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

16. The Works to Be Completed by the Intended Completion Date

16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

17. Approval by the Project Manager

17.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.

17.2 The Contractor shall be responsible for design of Temporary Works.

17.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

18. Safety

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

19. Discoveries

19.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Procuring Entity. The Contractor shall notify the Project

Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

20. Possession of the Site

- 20.1 The Procuring Entity shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date **stated in the SCC**, the Procuring Entity shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.

21. Access to the Site

- 21.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager 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.

22. Instructions, Inspections and Audits

- 22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.
- 22.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and sub-consultants to keep, accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.
- 22.3 The Contractor shall permit and shall cause its subcontractors and sub-consultants to permit, the Procuring Entity and/or persons appointed by the Public Procurement Regulatory Authority to inspect the Site and/or the accounts and records relating to the procurement process, selection and/or contract execution, and to have such accounts and records audited by auditors appointed by the Public Procurement Regulatory Authority. The Contractor's and its Subcontractors' and sub-consultants' attention is drawn to Sub-Clause 25.1 (Fraud and Corruption) which provides, inter alia, that acts intended to materially impede the exercise of the Public Procurement Regulatory Authority's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Public Procurement Regulatory Authority's prevailing sanctions procedures).

23. Appointment of the Adjudicator

- 23.1 The Adjudicator shall be appointed jointly by the Procuring Entity and the Contractor, at the time of the Procuring Entity's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Procuring Entity does not agree on the appointment of the Adjudicator, the Procuring Entity will request the Appointing Authority designated in the SCC, to appoint the Adjudicator within 14 days of receipt of such request.
- 23.2 Should the Adjudicator resign or die, or should the Procuring Entity and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Procuring Entity and the Contractor. In case of disagreement between the Procuring Entity and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority designated in the SCC at the request of either party, within 14 days of receipt of such request.

24. Settlement of Claims and Disputes

24.1 Contractor's Claims

24.1.1 If the Contractor considers itself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give Notice to the Project Manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 30 days after the Contractor became aware, or should have become aware, of the event or circumstance.

24.1.2 If the Contractor fails to give notice of a claim within such period of 30 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub- Clause shall apply.

24.1.3 The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

24.1.4 The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Project Manager. Without admitting the Procuring Entity's liability, the Project Manager may, after receiving any notice under this Sub-Clause, monitor the record- keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

24.1.5 Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- a) this fully detailed claim shall be considered as interim;
- b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Project Manager may reasonably require; and
- c) the Contractor shall send a final claim within 30 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Project Manager.

24.1.6 Within 42 days after receiving a Notice of a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Project Manager and approved by the Contractor, the Project Manager shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within the above defined time period.

- 24.1.7 Within the above defined period of 42 days, the Project Manager shall proceed in accordance with Sub-Clause
- 24.1.8 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.
- 24.1.9 Each Payment Certificate shall include such additional payment for any claim as has been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.
- 24.1.10 If the Project Manager does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Project Manager and any of the Parties may refer to Arbitration in accordance with Sub-Clause 24.4 [Arbitration].
- 24.1.11 The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Subclause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause 24.3.

24.2 Amicable Settlement

- 24.2.1 Where a notice of a claim has been given, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, the Party giving a notice of a claim in accordance with Sub-Clause 24.1 above should move to commence arbitration after the fifty-sixth day from the day on which a notice of a claim was given, even if no attempt at an amicable settlement has been made.

24.3 Matters that may be referred to arbitration

- 24.3.1 Notwithstanding anything stated herein the following matters may be referred to arbitration before the practical completion of the Works or abandonment of the Works or termination of the Contract by either party:
- a) The appointment of a replacement Project Manager upon the said person ceasing to act.
 - b) Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions.
 - c) Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
 - e) Any dispute arising in respect of war risks or war damage.
 - f) All other matters shall only be referred to arbitration after the completion or alleged completion of the Works or termination or alleged termination of the Contract, unless the Procuring Entity and the Contractor agree otherwise in writing.

24.4 Arbitration

- 24.4.1 Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 24.3 shall be finally settled by arbitration.
- 24.4.2 No arbitration proceedings shall be commenced on any claim or dispute where notice of a claim or dispute has not been given by the applying party within ninety days of the occurrence or discovery of the matter or issue giving rise to the dispute.
- 24.4.3 Notwithstanding the issue of a notice as stated above, the arbitration of such a claim or dispute shall not commence unless an attempt has in the first instance been made by the parties to settle such claim or dispute amicably with or without the assistance of third parties. Proof of such attempt shall be required.
- 24.4.4 The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, tests or valuations as may in his opinion be desirable in order to determine the rights of the parties and assess and award any sums which ought to have been the subject of or included in any certificate.
- 24.4.5 The Arbitrator shall, without prejudice to the generality of his powers, have powers to open up, review and revise any certificate, opinion, decision, requirement or notice and to determine all matters in dispute which shall be submitted to him in the same manner as if no such certificate, opinion, decision requirement or notice had been given.
- 24.4.6 The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Project Manager from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.
- 24.4.7 Neither Party shall be limited in the proceedings before the arbitrators to the evidence, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction.
- 24.4.8 Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, and the Project Manager shall not be altered by reason of any arbitration being conducted during the progress of the Works.
- 24.4.9 The terms of the remuneration of each or all the members of Arbitration shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

24.5 Arbitration with National Contractors

- 24.5.1 If the Contract is with national contractors, arbitration proceedings will be conducted in accordance with the Arbitration Laws of Kenya. In case of any claim or dispute, such claim or dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be referred 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, on the request of the applying party, by the Chairman or Vice Chairman of any of the following professional institutions;
- i) Architectural Association of Kenya
 - ii) Institute of Quantity Surveyors of Kenya
 - iii) Association of Consulting Engineers of Kenya
 - iv) Chartered Institute of Arbitrators (Kenya Branch)
 - v) Institution of Engineers of Kenya

24.5.2 The institution written to first by the aggrieved party shall take precedence over all other institutions.

24.6 Alternative Arbitration Proceedings

24.6.1 Alternatively, the Parties may refer the matter to the Nairobi Centre for International Arbitration (NCIA) which offers a neutral venue for the conduct of national and international arbitration with commitment to providing institutional support to the arbitral process.

24.7 Failure to Comply with Arbitrator's Decision

24.7.1 The award of such Arbitrator shall be final and binding upon the parties.

24.7.2 In the event that a Party fails to comply with a final and binding Arbitrator's decision, then the other Party may, without prejudice to any other rights it may have, refer the matter to a competent court of law.

24.8 Contract operations to continue

24.8.1 Notwithstanding any reference to arbitration herein,

- a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
- b) the Procuring Entity shall pay the Contractor any monies due the Contractor.

25. Fraud and Corruption

25.1 The Government requires compliance with the country's Anti-Corruption laws and its prevailing sanctions policies and procedures as set forth in the Constitution of Kenya and its Statutes.

25.2 The Procuring Entity requires the Contractor to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

B. Time Control

26. Program

26.1 Within the time stated in the SCC, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.

26.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

26.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period stated in the SCC. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the SCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In

the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.

- 26.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

27. Extension of the Intended Completion Date

- 27.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.
- 27.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.

28. Acceleration

- 28.1 When the Procuring Entity wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Procuring Entity accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Procuring Entity and the Contractor.
- 28.2 If the Contractor's priced proposals for an acceleration are accepted by the Procuring Entity, they are incorporated in the Contract Price and treated as a Variation.

29. Delays Ordered by the Project Manager

- 29.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.

30. Management Meetings

- 30.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
- 30.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Procuring Entity. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

31. Early Warning

- 31.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require

the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.

- 31.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

C. Quality Control

32. Identifying Defects

- 32.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

33. Tests

- 33.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

34. Correction of Defects

- 34.1 The Project Manager 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 SCC. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
- 34.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

35. Uncorrected Defects

- 35.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

D. Cost Control

36. Contract Price

- 36.1 The Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.

37. Changes in the Contract Price

- 37.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. The Project Manager shall not adjust rates from changes in quantities if thereby the Initial

Contract Price is exceeded by more than 15 percent, except with the prior approval of the Procuring Entity.

37.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

38. Variations

38.1 All Variations shall be included in updated Programs⁹ produced by the Contractor.

38.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

38.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

38.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

⁷In lump sum contracts, replace GCC Sub-Clauses 36.1 as follows:

36.1 The Contractor shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. The Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for materials on site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

⁸In lump sum contracts, replace entire GCC Clause 37 with new GCC Sub-Clause 37.1, as follows:

The Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

⁹In lump sum contracts, add "and Activity Schedules" after "Programs." ¹⁰In lump sum contracts, delete this paragraph.

38.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning

38.6 If the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Subclause 39.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing 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

- 38.7 Value Engineering: The Contractor may prepare, at its own cost, a value engineering proposal at any time during the performance of the contract. The value engineering proposal shall, at a minimum, include the following;
- a) the proposed change(s), and a description of the difference to the existing contract requirements;
 - b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life cycle costs) the Procuring Entity may incur in implementing the value engineering proposal; and
 - c) a description of any effect(s) of the change on performance/functionality.
- 38.8 The Procuring Entity may accept the value engineering proposal if the proposal demonstrates benefits that:
- a) accelerate the contract completion period; or
 - b) reduce the Contract Price or the life cycle costs to the Procuring Entity; or
 - c) improve the quality, efficiency, safety or sustainability of the Facilities; or
 - d) yield any other benefits to the Procuring Entity, without compromising the functionality of the Works.
- 38.9 If the value engineering proposal is approved by the Procuring Entity and results in:
- a) a reduction of the Contract Price; the amount to be paid to the Contractor shall be the **percentage specified in the SCC** of the reduction in the Contract Price; or
 - b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in
 - (a) to (d) above, the amount to be paid to the Contractor shall be the full increase in the Contract Price.

39. Cash Flow Forecasts

- 39.1 When the Program, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

40. Payment Certificates

- 40.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
- 40.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 40.3 The value of work executed shall be determined by the Project Manager.
- 40.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed¹².
- 40.5 The value of work executed shall include the valuation of Variations and Compensation Events.
- 40.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

40.7 Where the contract price is different from the corrected tender price, in order to ensure the contractor is not paid less or more relative to the contract price (which would be the tender price), payment valuation certificates and variation orders on omissions and additions valued based on rates in the Bill of Quantities or schedule of rates in the Tender, will be adjusted by a plus or minus percentage. The percentage already worked out during tender evaluation is worked out as follows: $(\text{corrected tender price} - \text{tender price}) / \text{tender price} \times 100$.

41. Payments

41.1 Payments shall be adjusted for deductions for advance payments and retention. The Procuring Entity shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of each certificate. If the Procuring Entity makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.

41.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.

41.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

41.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Procuring Entity and shall be deemed covered by other rates and prices in the Contract.

42. Compensation Events

42.1 The following shall be Compensation Events:

- d) The Procuring Entity does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.
- e) The Procuring Entity modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
- f) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.
- g) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
- h) The Project Manager unreasonably does not approve a subcontract to be let.
- i) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.
- j) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Procuring Entity, or additional work required for safety or other reasons.

- k) Other contractors, public authorities, utilities, or the Procuring Entity does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- l) The advance payment is delayed.
- m) The effects on the Contractor of any of the Procuring Entity's Risks.
- n) The Project Manager unreasonably delays issuing a Certificate of Completion.

42.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

42.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

¹¹In lump sum contracts, add "or Activity Schedule" after "Program."

¹²In lump sum contracts, replace this paragraph with the following: "The value of work executed shall comprise the value of completed activities in the Activity Schedule."

42.4 The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

43. Tax

43.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 30 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 44.

44. Currency of Payment

44.1 All payments under the contract shall be made in Kenya Shillings

45. Price Adjustment

45.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC**. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor

to the payment amounts due in each currency. A separate formula of the type specified below applies:

$$P = A + B I_m/I_o$$

where:

P is the adjustment

factor for the portion of the Contract Price payable.

A and B are coefficients¹³ **specified in the SCC**, representing the non-adjustable and adjustable portions, respectively, of the Contract Price payable and I_m is the index prevailing at the end of the month being invoiced and I_o is the index prevailing 30 days before Bid

opening for inputs payable.

- 45.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

46. Retention

- 46.1 The Procuring Entity shall retain from each payment due to the Contractor the proportion stated in the **SCC** until Completion of the whole of the Works.
- 46.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" Bank guarantee.

47. Liquidated Damages

- 47.1 The Contractor shall pay liquidated damages to the Procuring Entity at the rate per day stated in the **SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the SCC. The Procuring Entity may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.
- 47.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 41.1.

48. Bonus

- 48.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the SCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

49. Advance Payment

- 49.1 The Procuring Entity shall make advance payment to the Contractor of the amounts stated in the **SCC** by the date stated in the **SCC**, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Procuring Entity in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.
- 49.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

49.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

50. Securities

50.1 The Performance Security shall be provided to the Procuring Entity no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the SCC**, by a bank or surety acceptable to the Procuring Entity, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 day from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Completion Certificate in the case of a Performance Bond.

51. Dayworks

51.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

51.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

51.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

52. Cost of Repairs

52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

53. Completion

53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

54. Taking Over

54.1 The Procuring Entity shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

55. Final Account

55.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the

Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 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 Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

¹³The sum of the two coefficients A and B should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient A, for the non-adjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other non-adjustable components. The sum of the adjustments for each currency are added to the Contract Price.

56. Operating and Maintenance Manuals

56.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the SCC.

56.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the SCC pursuant to GCC Sub-Clause 56.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the SCC** from payments due to the Contractor.

57. Termination

57.1 The Procuring Entity or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

57.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

- a) the Contractor stops work for 30 days when no stoppage of work is shown on the current Program and the stoppage have not been authorized by the Project Manager;
- b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days;
- c) the Procuring Entity or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
- d) a payment certified by the Project Manager is not paid by the Procuring Entity to the Contractor within 84 days of the date of the Project Manager's certificate;
- e) the Project Manager 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 determined by the Project Manager;
- f) the Contractor does not maintain a Security, which is required;
- g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the SCC**; or
- h) if the Contractor, in the judgment of the Procuring Entity has engaged in Fraud and Corruption, as defined in paragraph 2.2 a of the Appendix A to the GCC, in competing for or in executing the Contract, then the Procuring Entity may, after giving fourteen (14) days written notice to the Contractor, terminate the Contract and expel him from the Site.

57.3 Notwithstanding the above, the Procuring Entity may terminate the Contract for convenience.

57.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

57.5 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 56.2 above, the Project Manager shall decide whether the breach is fundamental or not.

58. Payment upon Termination

58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as specified in the SCC. Additional Liquidated Damages shall not apply. If the total amount due to the Procuring Entity exceeds any payment due to the Contractor, the difference shall be a debt payable to the Procuring Entity.

58.2 If the Contract is terminated for the Procuring Entity's convenience or because of a fundamental breach of Contract by the Procuring Entity, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

59. Property

59.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Procuring Entity if the Contract is terminated because of the Contractor's default.

60. Release from Performance

60.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Procuring Entity or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

SECTION IX - SPECIAL CONDITIONS OF CONTRACT

Except where otherwise specified, all Special Conditions of Contract should be filled in by the Procuring Entity prior to issuance of the bidding document. Schedules and reports to be provided by the Procuring Entity should be annexed.

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
A. General	
GCC 1.1 (q)	The Procuring Entity is; MINISTRY OF WATER, SANITATION AND IRRIGATION STATE DEPARTMENT FOR IRRIGATION PRINCIPAL SECRETARY, STATE DEPARTMENT FOR IRRIGATION P. O. BOX 49720-00100 Email address: ps@irrigation.go.ke
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be Twenty-Four (24 Months) from the date of contract signing.
GCC 1.1 (x)	The Project Manager is Director, Irrigation and Drainage; State Department for Irrigation, Ministry of Water, Sanitation and Irrigation.
GCC 1.1 (z)	The Site is located at Gatanga Sub-County, Muranga County and is defined in drawings [IN THE APPENDIX]
GCC 1.1 (cc)	The Start Date shall be [Fourteen (14) days after the site possession] .
GCC 1.1 (gg)	The works consist of: • Preliminaries • Civil works • Mechanical works (as per the bill of quantities)
GCC 2.2	Sectional Completions are: Not Applicable
GCC 5.1	The Project manager may delegate some of his duties and responsibilities in writing
GCC 8.1	Schedule of other contractors: Not Applicable

GCC 9.1

Key Personnel

GCC 9.1 is replaced with the following:

GCC 38.9	If the value engineering proposal is approved by the Procuring Entity the amount to be paid to the Contractor shall be __N/A_% (insert appropriate percentage. The percentage is normally up to 50%) of the reduction in the Contract Price.
GCC 44.1	The currency of the Procuring Entity's Country is: Kenya Shillings
GCC 45.1	The Contract "is not" subject to price adjustment in accordance with GCC Clause 45, and the following information regarding coefficients [specify "does" or "does not"] apply. [Price adjustment is mandatory for contracts which provide for time of completion exceeding 18 months] N/A The coefficients for adjustment of prices are: (a) [N/A] percent nonadjustable element (coefficient A). (b) N/A percent adjustable element (coefficient B). (c) The Index I for shall be [N/A].
GCC 46.1	The proportion of payments retained is: 10% [The retention amount is usually close to 5 percent and in no case exceeds 10 percent.]
GCC 47.1	The liquidated damages for the whole of the Works are 0.10% of the final contract price per day. The maximum amount of liquidated damages for the whole of the Works is 10% of the final Contract Price. [Usually liquidated damages are set between 0.05 percent and 0.10 percent per day, and the total amount is not to exceed between 5 percent and 10 percent of the Contract Price. If Sectional Completion and Damages per Section have been agreed, the latter should be specified here]
GCC 48.1	The Bonus for the whole of the Works is [nil of final Contract Price] per day. The maximum amount of Bonus for the whole of the Works is [insert percentage] of the final Contract Price. [If early completion would provide benefits to the Procuring Entity, this clause should remain; otherwise delete. The Bonus is usually numerically equal to the liquidated damages.]

GCC 49.1

The Advance Payments MAY Be paid under

SECTION 147. (1) OF PPADA 2015

Under exceptional circumstances advance payment may be granted and shall not exceed twenty per cent (20 %) of the price of the tender and shall be paid upon submission by the successful tenderer to the procuring entity of an advance payment security equivalent to the advance itself and that security shall be given by a reputable bank or any authorized financial institution issued by a

	corresponding bank in Kenya recognized by the Central Bank of Kenya, in case the successful tenderer is a foreigner. SECTION 148. OF PPADA 2015 The successful tenderer shall use the advance paid only in activities related to the tender. If the successful tenderer uses the entire advance or part of it in other activities that are unrelated to the tender, the advance shall immediately be considered as a debt which shall be paid by seizing the entire security or part of it. SECTION 136. (4) OF PPADR 2020 The contractor shall confirm in writing that the advance payment shall only be used for purposes of the contract. The Advance Payments MAY Be paid under SECTION 147. (1) OF PPADA 2015 Under exceptional circumstances advance payment may be granted and shall not exceed twenty per cent (20 %) of the price of the tender and shall be paid upon submission by the successful tenderer to the procuring entity of an advance payment security equivalent to the advance itself and that security shall be given by a reputable bank or any authorized financial institution issued by a corresponding bank in Kenya recognized by the Central Bank of Kenya, in case the successful tenderer is a foreigner. SECTION 148. OF PPADA 2015 The successful tenderer shall use the advance paid only in activities related to the tender. If the successful tenderer uses the entire advance or part of it in other activities that are unrelated to the tender, the advance shall immediately be considered as a debt which shall be paid by seizing the entire security or part of it. SECTION 136. (4) OF PPADR 2020 The contractor shall confirm in writing that the advance payment shall only be used for purposes of the contract. 136. (1) Pursuant to section 147(2) of the Act, the amount of advance payment allowed shall be specified in the bid document... (2) Where an advance payment has been done pursuant to section 146 and 147 of the Act, the head of procurement function shall ensure that— (a) the bank guarantee has been authenticated by the issuing bank in writing to the accounting officer; (b) the bank guarantee shall be on demand;
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(c) the bank guarantee shall not be allowed to lapse unless the contractor has done a commensurate work or has supplied goods of equivalent value to the guarantee; and

(d) any payments made to the contractor shall be done in a manner to reduce the advance payment progressively.

(3) Where the advance payment has not been fully paid and the contract is terminated or frustrated, the outstanding advance payment shall be paid by the contractor.

(4) The contractor shall confirm in writing that the advance payment shall only be used for purposes of the contract.

(5) Where it has been confirmed by a procuring entity that the advance payment has been used contrary to paragraph (4), the advance payment shall be recovered from the bank guarantee.

(6) A procuring entity may apply for and open a letter of credit in international transactions.

GCC 50.1 Performance Securities amount is Shall Be (10%) one Percent of the Contract Sum

SECTION 135. (3) OF PPADR 2020,) Where performance security for goods, works and non- consultancy services for women, youth and persons with disabilities and other disadvantaged groups is required, the performance security shall not exceed one per cent of the contract sum.

(a) Performance Security – Bank Guarantee: in the amount(s) of [insert related figure(s)] percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.

(b) Performance Security – Performance Bond: in the amount(s) of [insert related figure(s)] percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.

E. Finishing the Contract

GCC 56.1 The date by which operating and maintenance manuals are required is [insert date].
N/A

The date by which “as built” drawings are required is [insert date]. N/A

GCC 56.2 The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 58.1 is (N/A).

GCC 57.2 The maximum number of days is: [N/A]. **(g)**

GCC 58.1 The percentage to apply to the value of the work not completed, representing the Procuring Entity’s additional cost for completing the Works, is [N/A].

FORM No 1: NOTIFICATION OF INTENTION TO AWARD

This Notification of Intention to Award shall be sent to each Tenderer that submitted a Tender. Send this Notification to the Tenderer's Authorized Representative named in the Tender Information Form on the format below.

FORMAT

1. For the attention of Tenderer's Authorized Representative

- i) Name: [insert Authorized Representative's name]
- ii) Address: [insert Authorized Representative's Address]
- iii) Telephone: [insert Authorized Representative's telephone/fax numbers]
- iv) Email Address: [insert Authorized Representative's email address]

[IMPORTANT: insert the date that this Notification is transmitted to Tenderers. The Notification must be sent to all Tenderers simultaneously. This means on the same date and as close to the same time as possible.]

2. Date of transmission: [email] on [date] (local time)

This Notification is sent by (Name and designation) _____

3. Notification of Intention to Award

- i) Procuring Entity: [insert the name of the Procuring Entity]
- ii) Project: [insert name of project]
- iii) Contract title: [insert the name of the contract]
- iv) Country: [insert country where ITT is issued]
- v) ITT No: [insert ITT reference number from Procurement Plan]

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period, you may:

4. Request a debriefing in relation to the evaluation of your tender

Submit a Procurement-related Complaint in relation to the decision to award the contract.

a) The successful tenderer

i) Name of successful Tender _____

ii) Address of the successful Tender _____

iii) Contract price of the successful Tenderer Kenya Shillings _____ (in words____)

b) Other Tenderers

Names of all Tenderers that submitted a Tender. If the Tender's price was evaluated include the evaluated price as well as the Tender price as read out. For Tenders not evaluated, give one main reason the Tender was unsuccessful.

S No	Name of Tender	Tender Price as read out	Tender's evaluated price (Note a)	One Reason Why not Evaluated
1				
2				
3				
4				
5				

(Note a) State NE if not evaluated

5. How to request a debriefing

- a) **DEADLINE:** The deadline to request a debriefing expires at midnight on [insert date] (local time).
- b) You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (5) Business Days of receipt of this Notification of Intention to Award.
- c) Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:
 - i) Attention: [insert full name of person, if applicable]
 - ii) Title/position: [insert title/position]
 - iii) Agency: [insert name of Procuring Entity]
 - iv) Email address: [insert email address]
- d) If your request for a debriefing is received within the 3 Days deadline, we will provide the debriefing within five (3) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (3) Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.

- e) The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.
- f) If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Days from the date of publication of the Contract Award Notice.

6. How to make a complaint

- a) Period: Procurement-related Complaint challenging the decision to award shall be submitted by midnight, [insert date] (local time).
- b) Provide the contract name, reference number, name of the Tenderer, contact details; and address the Procurement-related Complaint as follows:
 - i) Attention: [insert full name of person, if applicable] ii) Title/position: [insert title/position] iii) Agency: [insert name of Procuring Entity] iv) Email address: [insert email address]

- c) At this point in the procurement process, you may submit a Procurement-related Complaint challenging the decision to award the contract. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends.

- d) Further information: For more information refer to the Public Procurement and Disposals Act 2015 and its Regulations available from the Website info@ppra.go.ke or complaints@ppra.go.ke.

You should read these documents before preparing and submitting your complaint.

- e) There are four essential requirements:
 - i) You must be an 'interested party'. In this case, that means a Tenderer who submitted a Tender in this tendering process, and is the recipient of a Notification of Intention to Award.
 - ii) The complaint can only challenge the decision to award the contract. iii) You must submit the complaint within the period stated above.
 - iv) You must include, in your complaint, all of the information required to support your complaint.

7. Standstill Period

- i) DEADLINE: The Standstill Period is due to end at midnight on [insert date] (local time).
- ii) The Standstill Period lasts ten (14) Days after the date of transmission of this Notification of Intention to Award.
- iii) The Standstill Period may be extended as stated in paragraph Section 5 (d) above.

If you have any questions regarding this Notification please do not hesitate to contact us. On behalf of the Procuring Entity:

Signature:

Name: _____

Title/position:

_ Telephone:_ Email: _____

FORM NO. 2 - REQUEST FOR REVIEW

FORM FOR REVIEW (r.203(1))

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 ofdated the...day of20.....in the matter of Tender No.....of20.... for(Tender description).

REQUEST FOR REVIEW

I/We....., the above-named Applicant(s), of address: Physical address..... P. O. Box 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.

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

1.

2.

SIGNED (Applicant) Dated on..... day of/...20.....

FOR OFFICIAL USE ONLY Lodged with the Secretary Public Procurement Administrative Review Board on.....day of20.....

SIGNED

Board Secretary

FORM NO 3: LETTER OF AWARD

[letterhead paper of the Procuring Entity] [date]

To: [name and address of the Contractor]

This is to notify you that your Tender dated [date] for execution of the [name of the Contract and identification number, as given in the Contract Data] for the Accepted Contract Amount [amount in numbers and words] [name of currency], as corrected and modified in accordance with the Instructions to Tenderers, is hereby accepted by (name of Procuring Entity).

You are requested to furnish the Performance Security within 30 days in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VIII, Contract Forms, of the Tender Document.

Authorized

Signature:

Name and Title of
Signatory:

Name of Procuring
Entity.....

Attachment: Contract
Agreement.....

FORM NO 4: CONTRACT AGREEMENT

THIS AGREEMENT made the ___ day of _____, 20__, between
_____ of _____ (hereinafter
"the Procuring
Entity"), of the one part, and _____ of
_____ (hereinafter "the Contractor"), of the other part:

WHEREAS the Procuring Entity desires that the Works known as _____ should
be executed by the Contractor, and has accepted a Tender by the Contractor for the execution and
completion of these Works and the remedying of any defects therein,

The Procuring Entity and the Contractor agree as follows:

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

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

Signed and sealed by _____ (for the Procuring Entity)

Signed and sealed by _____ (for the Contractor).

FORM NO. 5 - PERFORMANCE SECURITY

[Option 1 - Unconditional Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ [insert name and Address of Procuring Entity] **Date:** _____

_____[Insert date of issue]

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated__ with

(name of Procuring Entity)_(the Procuring Entity as the Beneficiary), for the execution of _____ (hereinafter called "the Contract").

2. Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.
3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of_(in words),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.
4. This guarantee shall expire, no later than the Day of, 2.....², and any demand for payment under it must be received by us at the office indicated above on or before that date.
5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

[Name of Authorized Official, signature(s) and seals/stamps].

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

¹The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.

²Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this

guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM No. 6 - PERFORMANCE SECURITY

[Option 2– Performance Bond]

[Note: Procuring Entities are advised to use Performance Security – Unconditional Demand Bank Guarantee instead of Performance Bond due to difficulties involved in calling Bond holder to action]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: _____[insert name and Address of Procuring Entity]

Date: _____[Insert date of issue].

PERFORMANCE BOND No.: _____

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

1. By this Bond as Principal (hereinafter called "the Contractor") and _____ as Surety (hereinafter called "the Surety"), are held and firmly bound unto _____ as Oblige (hereinafter called "the Procuring Entity") in the amount of _____ for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.
2. WHEREAS the Contractor has entered into a written Agreement with the Procuring Entity dated the _____ day of _____, 20, for in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.
3. NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Procuring Entity to be, in default under the Contract, the Procuring Entity having performed the Procuring Entity's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:
 - 1) complete the Contract in accordance with its terms and conditions; or
 - 2) obtain a tender or tenders from qualified tenderers for submission to the Procuring Entity for completing the Contract in accordance with its terms and conditions, and upon determination by the Procuring Entity and the Surety of the lowest responsive Tenderers, arrange for a Contract between such Tenderer, and Procuring Entity and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the

Contract Price," as used in this paragraph, shall mean the total amount payable by Procuring Entity to Contractor under the Contract, less the amount properly paid by Procuring Entity to Contractor; or

- 3) pay the Procuring Entity the amount required by Procuring Entity to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.
4. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.
5. Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate. No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Procuring Entity named herein or the heirs, executors, administrators, successors, and assigns of the Procuring Entity.
6. In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this day of 20.

SIGNED ON _____ on behalf of by _____ in the capacity of _____ in the presence of _____

SIGNED ON _____ on behalf of by _____ in the capacity of _____

In the presence of _____

FORM NO. 7 - ADVANCE PAYMENT SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: [Insert name and Address of Procuring Entity]

Date: [Insert date of issue]

ADVANCE PAYMENT GUARANTEE No.: _____ [Insert guarantee reference number]

Guarantor: _____ [Insert name and address of place of issue, unless indicated in the letterhead]

1. We have been informed that (hereinafter called "the Contractor") has entered into Contract No. dated with the Beneficiary, for the execution of (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (in words) is to be made against an advance payment guarantee.
3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of (in words _____)¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:
 - a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
 - b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Contractor on its account number at _____
5. The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the _____ day of _____, 2, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

¹The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency of the advance payment as specified in the Contract.

²Insert the expected expiration date of the Time for Completion. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 8 - RETENTION MONEY SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: [Insert name and Address of Procuring Entity]

Date: [Insert date of issue]

Advance payment guarantee no. [Insert guarantee reference number]

Guarantor: [Insert name and address of place of issue, unless indicated in the letterhead]

1. We have been informed that [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "the Contractor") has entered into Contract No. ____ [insert reference number of the contract] dated ____ with the Beneficiary, for the execution of [insert name of contract and brief description of Works] (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, and payment of [insert the second half of the Retention Money] is to be made against a Retention Money guarantee.
3. At the request of the Contractor, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [insert amount in figures] ([insert amount in words]) upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Contractor on its account number at ____ [insert name and address of Applicant's bank].
5. This guarantee shall expire no later than the Day of

....., 2.....², and any demand for payment

under it must be received by us at the office indicated above on or before that date.

6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

¹The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.

²Insert a date that is twenty-eight days after the expiry of retention period after the actual completion date of the contract. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM

(Amended and issued pursuant to PPRA [CIRCULAR No. 02/2022](#))

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form ("Form") is to be completed by the successful tenderer pursuant to Regulation 13 (2A) and 13 (6) of the Companies (Beneficial Ownership Information) Regulations, 2020. In case of joint venture, the tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the legal person (tenderer) or arrangements or a natural person on whose behalf a transaction is conducted, and includes those persons who exercise ultimate effective control over a legal person (Tenderer) or arrangement.

Tender Reference No.: _____[insert identification no] Name of the Tender
Title/Description: _____
_____[insert name of the assignment] to:
_____[insert complete name of Procuring
Entity]

In response to the requirement in your notification of award dated_[insert date of notification of award] to furnish additional information on beneficial ownership:
_____[select one option as applicable and delete the options that are not applicable]

I) We here by provide the following beneficial ownership information.

Details of beneficial ownership

Details of all Beneficial Owners		% of shares a person holds in the company Directly or indirectly	% of voting rights a person holds in the company	Whether a person directly or indirectly holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer (Yes / No)	Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)
Full Name			Directly.....		

1.	National identity card number or Passport number		Directly--% of shares	 % of voting rights	1.Having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer: Yes ----No---- 2.Is this right held directly or indirectly? Direct..... Indirect.....	1.Exercises significant influence or control over the Company body of the Company (tenderer) Yes ----No---- 2.Is this influence or control exercised directly or indirectly? Direct.....
	Personal Identification Number (where applicable)		Indirectly-----% of shares	-----% of voting rights		
	Nationality					
	Date of birth [dd/mm/yyyy]					
	Postal address					
	Residential address					

	Details of all Beneficial Owners		% of shares a person holds in the company Directly or indirectly	% of voting rights a person holds in the company	Whether a person directly or indirectly holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer (Yes / No)	Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)
	Telephone number					Indirect.....
	Email address					
	Occupation or profession					
2.	Full Name		Directly-----of	Directly.....	1.Having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer: Yes ----No----	1.Exercises significant influence or control over the Company body of the Company (tenderer)
	National identity card number or Passport number		- % shares of	 % of voting rights Indirectly-----% of		

	Personal Identification Number (where applicable) Nationality (ies) Date of birth [dd/mm/yyyy] Postal address Residential address Telephone number Email address Occupation or profession		Indirectly----- - % shares	voting rights	2.Is this right held directly or indirectly? Direct..... Indirect.....	Yes -----No----- 2.Is this influence or control exercised directly or indirectly? Direct..... Indirect.....
3.						
	Details of all Beneficial Owners	% of shares a person holds in the company Directly or indirectly	% of voting rights a person holds in the company	Whether a person holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer (Yes / No)	Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)	
etc.						

II) Am fully aware that beneficial ownership information above shall be reported to the Public Procurement Regulatory Authority together with other details in relation to contract awards and shall be maintained in the Government Portal, published and made publicly available pursuant to Regulation 13(5) of the Companies (Beneficial Ownership Information) Regulations, 2020.(Notwithstanding this paragraph Personally Identifiable Information in line with the Data Protection Act shall not be published or made public). Note that Personally Identifiable Information (PII) is defined as any information that can be used to distinguish one person from another and can be used to deanonymize previously anonymous data. This information includes National identity card number or Passport number, Personal Identification Number, Date of birth, Residential address, email address and Telephone number.

III) In determining who meets the threshold of who a beneficial owner is, the Tenderer must consider a natural person who in relation to the company:

- (a) holds at least ten percent of the issued shares in the company either directly or indirectly;
- (b) exercises at least ten percent of the voting rights in the company either directly or indirectly;
- (c) holds a right, directly or indirectly, to appoint or remove a director of the company; or
- (d) exercises significant influence or control, directly or indirectly, over the company.

IV) What is stated to herein above is true to the best of my knowledge, information and belief.

Name of the Tenderer:*[insert complete name of the Tenderer]

Name of the person duly authorized to sign the Tender on behalf of the Tenderer:

** [insert complete name of person duly authorized to sign the Tender]

Designation of the person signing the Tender: [insert complete title of the person signing the Tender]

Signature of the person named above: [insert signature of person
whose name and capacity are shown above]

Date this [insert date of signing] day of..... [Insert month],
[insert year]

PRE-TENDER SITE VISIT ATTENDANCE FORM

This is to certify that M/S.....
(Name of the Tenderer) have participated in the Pre – tender site Visit held on
..... for the
..... (Tender
Name) of Number.....
(Tender Number)

I..... Head, Supply
Chain Management Services and Client Representative of the State Department for Irrigation do
hereby certify that.....
(Name of tender/tenderers representative)

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

Have actually attended the Pre-Tender Site Visit for the Construction of
.....
(Name of the services for which bids are invited)

This.....day of.....month.....20.....

..... Signature

Official Stamp

Declaration (by Tenderer)

I.....
(Name of tenderer)

Do hereby declare that we have participated in the pre-Tender Site Visit held on for the above services.

.....
Signature

.....

Official Stamp

Bidder Official Stamp