THIKA WATER AND SEWERAGE COMPANY LIMITED (THIWASCO)

TENDER NO: THIWASCO/046/ UTPRP /2022-2023

UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT
PHASE 2

MANAGING DIRECTOR
THIKA WATER AND SEWERAGE COMPANY LTD,
P.O. BOX 6103 - 00100, THIKA – KENYA.

(2022-2023)

CLOSING DATE
Wednesday, February 1, 2023 at 11.00am

INVITATION TO TENDER

PROCURING ENTITY: *Thika Water & Sewerage Company Limited (THIWASCO]*

CONTRACT NAME AND DESCRIPTION: *UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT PHASE 2 (THIWASCO/046/UTPRP/2022-2023)*

1. THIWASCO invites sealed tenders for the: *UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT PHASE 2 (THIWASCO/046/UTPRP/2022-2023)*

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

3. Qualified and interested tenderers may obtain further information and inspect the Tender Documents during office hours *[0800hrs to 1600 hrs]* at the address given below.

4. A complete set of tender documents may be purchased or obtained by interested tenders upon payment of a non-refundable fees of (*1,000 Kenya shillings*) in cash or Banker's Cheque and payable to the address given below. Tender documents may be obtained electronically from the Website. Tender documents obtained electronically will be free of charge.
   ACCOUNT NAME: THIKA WATER AND SEWERAGE COMPANY LTD
   BANK:EQUITY
   ACCOUNT NO:0090294392028 Code 027

5. Tender documents may be viewed and downloaded for free from the website **www.thikawater.co.ke**. Tenderers who download the tender document must forward their particulars immediately to *procurement@thikawater.co.ke* to facilitate any further clarification or addendum.

6. Tenders shall be quoted be in Kenya Shillings and shall include all taxes. Tenders shall remain valid for (182) days from the date of opening of tenders.

7. All Tenders must be accompanied by a **tender Security** of **Kshs.2,700,000.00**

8. The Tenderer shall chronologically serialize all pages of the tender documents submitted.

9. Completed tenders must be delivered to the address below on or before **Wednesday, February 1, 2023 at 11.00am**. Electronic Tenders **will not** be permitted.

10. Tenders will be opened immediately after the deadline date and time specified above or any dead line date and times specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.

11. Late tenders will be rejected.

12. The addresses referred to above are:

A. Address for obtaining further information and for purchasing tender documents

(1) Name of Procuring Entity: **Thika Water and Sewerage Company Ltd**

(2) Physical address for hand Courier Delivery to an office or Tender Box: **Thika Head Office Near Bluepost Hotel, Along Haile Sellasie Road**

(3) Postal Address: **P.O. Box 6103-01000 Thika**

(4) Insert name, telephone number and e-mail address of the officer to be contacted.: **Procurement Office, 0720-418444, Procurement@thikawater.co.ke**

B. Address for Submission of Tenders.

1) Name of Procuring Entity: **Thika Water & Sewerage Company Ltd**

2) Postal Address **P.O. Box 6103-01000 Thika**

(1) Physical address for hand Courier Delivery to an office or Tender Box: **Thika Head Office Near Bluepost Hotel, Along Haile Sellasie Road**

C. Address for Opening of Tenders.

1) Name of Procuring Entity: **Thika Water & Sewerage Company Ltd**

(1) Physical address for the location: **Thika Head Office Near Bluepost Hotel, Along Haile Sellasie Road**

[*Authorized Official*]

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

Name Dr. Moses Kinya

Designation Managing Director

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 sub-contractors 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

i) Section I - Instructions to Tenderers (ITT)
ii) Section II - Tender Data Sheet (TDS)
iii) Section III - Evaluation and Qualification Criteria
iv) Section IV - Tendering Forms

PART 2 Works Requirements

i) Section V - Drawings
ii) Section VI - Specifications
iii) Section VII - Bills of Quantities

PART 3 Conditions of Contract and Contract Forms

i) Section VIII - General Conditions of Contract (GCC)
ii) Section IX - Special Conditions of Contract (SC)
iii) 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 19establishing 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.

23.2 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 error

29.2 s discovered by the Procuring Entity in the evaluation of the tenders, in accordance with ITT 33.

29.3 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 ITT39;
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: ***Upgrade of Thika Water Treatment Plant Rehabilitation Project Phase 2*** The reference number of the Contract is: **(THIWASCO/046/UTPRP/2022-2023)** The number and identification of lots (contracts) comprising this Tender are *[insert number and identification of lots (contracts)]* Lot 1- Name: **Not Applicable** Lot 2- Name: Not applicable Lot 3- Name: Not applicable
ITT 2.3	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: ***[two].***
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: Not applicable Time: not applicable Place: not applicable (B) A pre-arranged pretender visit of the site of the works *["shall""]* take place at the following date, time and place: Date: **Monday, 16th January, 2023** Time: 11.00am Place: THIWASCO MAIN OFFICES
ITT 8.2	The Tenderer will submit any questions in writing, to reach the Procuring Entity not later than **5.00pm Thursday, January 26, 2023**
ITT 8.4	(A) A pre-arranged pretender site visit **shall** take place. Date: **Monday, 16th January, 2023** **Time: 11.00am** **Place: THIWASCO MAIN OFFICES** Place: **Members to meet at head office, then proceed to site.** (B) Pre-Tender meeting **shall not** take place
ITT 9.1	For Clarification of Tender purposes, for obtaining further information and for purchasing tender documents, the Procuring Entity's address is: (1)Name of Procuring Entity: **Thika Water And Sewerage Company Ltd** (2)Physical address for hand Courier Delivery to an office or Tender Box (City, Street, Building, Floor Number and Room) **THIWASCO** **Head Office, Haile Sellasie Road Near BluePost Hotel Room No.1** (3)Postal Address: **P.O. Box 6103-01000 Thika.**

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	(4)Insert name, telephone number and e-mail address of the officer to be contacted **Procurement Department, 0720-418444, procurement@thikawater.co.ke**
C. Preparation of Tenders	
ITP 13.1 (h)	The Tenderer shall submit the following additional documents in its Tender: **No other additional documents required.**
ITT 15.1	Alternative Tenders *["**shall not be**"]* considered.
ITT 15.2	Alternative times for completion *["**shall not be"]*** permitted.
ITT 15.4	Alternative technical solutions shall be permitted for the following parts of the Works: **Not Permitted**
ITT 16.5	The prices quoted by the Tenderer shall be: ***"fixed"***
ITT 20.1	The Tender validity period shall be **182** days.
ITT 20.3 (a)	(a) The delayed to exceeding **none** number of days. (b) The Tender price shall be adjusted by the following percentages of the tender price: (i) By **none** % of t*he local currency portion of the Contract price adjusted to reflect local inflation during the period of extension,* *and* *(ii) By **none** % 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 ***shall be"*** required. A Tender-Securing Declaration [*"**shall be"]*** required for special group eligible bidders who wishes to participate. The type of Tender security shall be **2,700,000.00** in the amount of Kenya shillings **from a financial institution as indicated on PPRA Website.**
ITT 21.2 (d)	The other Tender Security shall be: no **other tender security**
ITT 21.5	On the Performance Security, other documents required shall be: **Program of works, insurance policies.** Performance security shall be 10% of the total quoted amount.
ITT 22.1	In addition to the original of the Tender, the number of copies is: **two copies (original and a copy)**
ITT 22.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of: **Confidential business questionnaire duly completed detailing directors/partners/sole proprietorship, MUST disclose power of attorney of the signatory.**
D. Submission and Opening of Tenders	
ITT 24.1	(A) For Tender submission purposes only, the Procuring Entity's address is: (1) Name of Procuring Entity: **Thika Water & Sewerage Company Ltd** (2) Postal Address **Managing Director, P.O. Box 6103-01000 Thika,**

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	(3Physical address for hand Courier Delivery to an office or Tender Box: **THIWASCO Main Offices, haile Sellasie Road near BluePost Hotel, Procurement Office, Room No. 1** (4) Date and time for submission of Tenders: **Wednesday, 1st February, 2023 at 11.00am** (5) Tenders **shall not submit** tenders electronically.
ITT 27.1	The Tender opening shall take place at the time and the address for Opening of Tenders provided below: (1) Name of Procuring Entity: **Thika Water & Sewerage Company Ltd** (2) Physical address for the location **THIWASCO Main Offices, haile Sellasie Road near Blue Post Hotel.** (3) State date and time of tender opening: **Wednesday, 1st February, 2023 at 11.00am**
ITT 27.1	If Tenderers are allowed to submit Tenders electronically, they shall follow the electronic tender submission procedures**: Not permitted** _____ _____
ITT 27.6	The number of representatives of the Procuring Entity to sign is: **Four**.
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.
ITT33.2	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.
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: ***not permitted*** *% of the total contract amount.* Tenderers planning to subcontract more than 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 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.
ITT45.0	**Award Criteria**
ITT 45.2	The Procuring Entity shall award the Contract to the successful tenderer whose tender has been determined to be the Lowest Evaluated Tender

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 51.1	The person named to be appointed as Adjudicator is **National Centre For International Arbitration**
ITT 52.2	Other documents required are**: no other documents required**
ITT 54.1	The procedures for making a Procurement-related Complaints are detailed in the "Regulations" available from the PPRA Website www.ppra.go.ke or email complaints@ppra.go.ke. If a Tenderer wishes to make a Procurement-related Complaint, the Tenderer should submit its complaint following these procedures, in writing (by the quickest means available, that is either by hand delivery or email to: For the attention: *[Dr. Moses Kinya]* Title/position: *[Managing Director]* Procuring Entity: *[Thika Water & Sewerage Company Ltd]* Email address*: [info@thikawater.co.ke or procurement@thikawater.co.ke]* In summary, a Procurement-related Complaint may challenge any of the following: (i) the terms of the Tender Documents; and (ii) the Procuring Entity's decision to award the contract.

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 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]

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:
……

ii) Alternative Technical Solutions for specified parts of the Works, if permitted under ITT 13.4, will be evaluated as follows: ……

iii) Other Criteria; if permitted under ITT 35.2(d):
……

4. Multiple Contracts

Multiple contracts will be permitted in accordance with ITT 35.4. Tenderers are evaluated on basis of Lots and the lowest evaluated tenderer identified for each Lot. The Procuring Entity will select one Option 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 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 ward (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 pay ment) sufficient to meet the construction cash flow of Kenya Shillings _____.

ii) 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.

iii) At least_____(*insert number)* of 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 Kenya shillings_____equivalent.

iv) Contractor's Representative and Key Personnel, which are specified as _____

v) Contractors key equipment listed on the table "Contractor's Equipment" below and more specifically listed as *[specify requirements for each lot as applicable]* _____

vi) 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 last_____(*specify years*). 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_____(*specify years*). 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 To be Completed by Tenderer***	***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 the Kenya Revenue Authority in accordance with ITT 3.14.	Form of Tender	
3	Conflict of Interest	No conflicts of interest in accordance with ITT 3.3	Form of Tender	
4	PPRA Eligibility	Not having been declared ineligible by the PPRA as described in ITT 3.8	Form of Tender	
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 1st January […….].	Form CON-2	
8	Suspension Based on Execution of Tender/Proposal Securing Declaration by the Procuring Entity	Not under suspension based on-execution of a Tender/Proposal Securing Declaration pursuant to ITT 19.9	Form of Tender	
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 1st 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	Form FIN – 3.1, with attachments	

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)***
		finance to meet the cash flow requirements on works currently in progress and for future contract commitments. (iii) The audited balance sheets or, if not required by the laws of the 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, sub-contractor, or management contractor for at least the last *[insert number of years]* years, starting 1st January *[insert year]*.	Form EXP – 4.1	
	Specific Construction & Contract Management Experience	A minimum number of *[state the number]* similar contracts specified below that have been 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]*	Form EXP 4.2(a)	

APPENDIX TO SECTION III - EVALUATION AND QUALIFICATION CRITERIA

Particulars to the appendix of evaluation and qualification criteria below shall be used to determine the lowest evaluated responsive bidder who shall be awarded the contract;

PART A	**MANDATORY EVALUATION CRITERIA *(Noncompliance with any MANDATORY requirement willautomatically result in disqualification*)**			
	Preliminary examination for Determination of Responsiveness	**Responsiveness**	**Not responsive**	**Indicate page number where evidence is provided**
1.1	Attach copies of incorporation or certificate or registration certificate			
1.2	Dully filled and stamped form of tender and price schedule in the format provided for in the tender document			
1.3	Duly filled, signed and stamped confidential business questionnaire in the format provided for in the tender document			
1.4	Proof of NCA1 and a valid practicing License (for water works)			
1.5	Attach relevant Valid Tax Compliance certificate			
1.6	Attach a valid business permit			
1.7	Attach CR12 /Partnership deed			
1.8	Attach Copies of IDs of Directors			
1.9	Provide proof of physical address (attach copy of rental or lease agreement			
2.0	Duly filled, signed and stamped Tender-Securing Declaration form in the format provided for in the tender document			

2.1	Bid security of Kshs.2,700,000.00 from reputable Commercial Bank or approved insurance company by PPRA and shall be valid for 182 days from date of tender opening.			
2.2	No consistent history of court/arbitral award decisions against the tenderer since 1st January 2020-fill form CON-2, nationality **Forms ELI – 1.1 and 1.2, with attachments**			
2.3	History of non -performance Non-performance of a contract did not occur as a result of contractor default since 1st January 2017 – fill Form CON-2			
2.4	Bidders must serialize every page of the bid document submitted from page one to the last page			
2.5	Bidders shall prepare and submit two copies marked clearly “ORIGINAL and COPY bid”			
2.6	Bidders shall submit their tender documents in line with all the formats provided in the tender document.			

PART B	TECHNICAL EVALUATION CRITERIA (any bidder who fails to satisfy any of the technical requirement will be disqualified for further evaluation)			
	Technical evaluation criteria	**Met**	**Not met**	**Indicate page number where evidence is provided**
1.0	Proof of work of similar magnitude undertaken in the last five years. Attach proof copies of completion certificate, letters of awards, LPOs/LSOs.-(***provide evidence of certified copies***)			
1.1	Submission of certified audited financial statements for the last three years to demonstrate the current soundness of the tenderersfinancial position and its long-term profitability-complete form FIN-3.1with attachments			
1.2	Annual construction turnover of KES 200 million Liquidity ratios (minimum1:1) Current ratio=current asset/current liabilities			
1.3(i)	The tenderer shall demonstrate he 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 (200,000,000.00)			
1.3(ii)	The tenderers shall also demonstrate, to satisfaction of the procuring entity that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments			
1.3(iii)	The audited balance sheets for the last three years shall be submitted and must demonstrate the current soundness of the tenderers position and indicate its prospective long-term profitability. Complete form FIN- 3.1,with attachments			

1.4	Minimum average annual construction turnover of ksh (200,000,000.00) equivalent calculated as total certified payments received for contracts in progress and/ or completed within the last three years. Complete form FIN-3.2			
1.5	A minimum number of three similar contracts that have been satisfactorily and substantially completed. complete form EXP 4.2(a)			
1.6	History of non- performing contract- complete form CON-2			
1.7	**Key Technical staff Provide detailed proposal of key technical members for the proposed project, copies and CV of the proposed team, Enclose detailed certificate**			
1.7(i)	Project Manager (Minimum qualification is degree in civil engineering or a related engineering field) with 5 years minimum relevant experience			
1.7(ii)	Site Agent (Minimum qualification is diploma in civil or water related engineering field) Supervisors (Minimum qualification is diploma in related engineering field) with 3 years minimum relevant experience			
1.7(iii)	Foreman (Minimum qualification is diploma in civil or water related engineering field) with 10 years relevant experience			
1.8	**Equipment (proof of valid ownership / lease agreement)** • Excavator/backhoe (Engine power 120kw/160Hp) with Rock breaker (Impact Energy 21kg-m minimum) • Water Pumps (Minimum 20m3/hr)			

	(Provide log books/ valid lease agreements) – complete forms ELI-1.1 and 1.2 with attachments Concrete mixer 350 litres Plate compactor			
1.9	Submit a draft methodology and program of works in the form of a bar chart which shall form part of the contract if the bid is accepted. Any change in the program or schedule shall be subjected to the approval of the Client			
2.0	Attach Copy of Valid Certificate of N.S.S.F. and N.H.I.F			
2.1	Provide evidence of construction of conventional water treatment with capacity of at least 10,000m3 . Demonstrate experience in installation of inclined settlers in clarifiers in at least two projects. Attach tube settler's manufacturers authorization and brochures. Provide installation methodology.			
PART C	**POST QUALIFICATION CRITERIA**	**Responsive**	**Not responsive**	**Indicate page number where evidence is provided**
1.0	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 p a y m e n t) sufficient to meet t h e construction c a s h fl o w o f K e n y a Shillings 200,000,00.00			
1.1	Minimum average annual construction turnover of Kenya Shillings [200,000,000.00], equivalent calculated as total certified payments received for contracts in progress and/or completed within the last [insert of year] years.			
1.3	Confirm at least (two) of 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 Kenya shillings equivalent			
1.4	Confirm not having history of non-performance of the previous works awarded			
PART D	**FINANCIAL EVALUATION AND CONTRACT AWARD**	**The tender shall be awarded to the lowest most evaluated responsive bidder within the budget .in case of a tie competitive bidding shall be applied in accordance to the procedures envisaged in the PPADA 2015 and PPADR 2020.**		

To Note:

Tenders that pass the preliminary technical examination will be further subjected to arithmetical corrections; A bid with an arithmetic error committed that will have some deviations with the form of tender and the detailed financial proposal will lead to automatic disqualification.

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: _____

ITT No. and title: _____

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, a list of Board of Directors, and the beneficial ownership.

4.2 FORM ELI -1.2

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

ITT No. and title: _____

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, a list of Board of Directors, and the beneficial ownership.

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 in 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: _____
JV Member's Name_____
ITT No. and title: _____

4.4.1. Financial Data

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

Type of Financial information in_____ (currency)	Historic information for previous _____*years*, _____ (amount in currency, currency, exchange rate*, USD equivalent)				
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
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 statements[1] 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.

4.5 FORM FIN – 3.2:

Average Annual Construction Turnover

Tenderer's Name: _____
Date: _____
JV Member's Name_____
ITT No. and title: _____

	Annual turnover data (construction only)		
Year	**Amount Currency**	**Exchange rate**	**Kenya Shilling equivalent**
[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		

4.7 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					
	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					

4.8 FORM EXP - 4.1

General Construction Experience

Tenderer's Name: _____
Date: _____
JV Member's Name_____
ITT No. and title: _____

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: _____	

4.9 FORM EXP - 4.2(a)

Specific Construction and Contract Management Experience

Tenderer's Name: _____
Date: _____
JV Member's Name_____
ITT No. and title: _____

Similar Contract No.	**Information**			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor ☐	Member in JV ☐	Management Contractor ☐	Sub-contractor ☐
Total Contract Amount			**Kenya Shilling**	
If member in a JV or sub-contractor, 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	

4.11 FORM EXP - 4.2(b)

Construction Experience in Key Activities

Tenderer's Name: _____
Date: _____
Tenderer's JV Member Name: _____
Sub-contractor's Name[2] (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 Contractor ☐	Sub-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:	

2. Activity No. Two
3. ……

OTHER FORMS

5. FORM OF TENDER

INSTRUCTIONS TO TENDERERS

i) The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address.

ii) All italicized text is to help Tenderer in preparing this form.

iii) Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION OF THE TENDERER attached to this Form of Tender.

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]*

Request for Tender No.: *[insert identification*]

Name and description of Tender *[Insert as per ITT)*

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]*_____Kenya 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) We, the Tenderer, have completed fully and signed 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, contacts 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	% Shares owned
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 OR NO	If YES provide details of the relationship with Tenderer
1	Tenderer is directly or indirectly controls, 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.		

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
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, non-consulting 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 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 tender] in response to the request for tenders made by:_____[Name of Tenderer] do hereby make the following statements that I certify to be true and complete in every respect:

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 orexperience;

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 PROCUREMENTAND ASSET DISPOSALACT 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.

……. ……. …… (Title)
(Signature) (Date)

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…….....……

E-mail…….....….....…

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 Sub-contractors, 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 sub-section 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 award[1] 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, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

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 inspect[2] all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and 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.

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[1] *For 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.*

[2] *Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Investigating Authority or persons appointed by the Procuring Entity to address specific matters related to investigations/audits, such as 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 forTenders No:

_____

Date:_____

TENDER GUARANTEE No.:_____

Guarantor: _____

1. We have been informed that_____(here inafter called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here inafter 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 provided 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 onor 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

Drawings are attached as annexure 1 to this bid document

SECTION VI-SPECIFICATIONS

SECTION 1. GENERAL REQUIREMENTS

1. Quality and Approvals

The materials and workmanship shall be the best of their respective kinds and to the approval of the Engineer. The words "to the approval of the Engineer" shall be deemed to be included in the description of all items relating to design, construction, installation and materials and workmanship for the due execution of the Works.

The Contractor shall submit all data, details and samples as necessary and as reasonably requested by the Engineer of all materials that the Contractor proposes to use in the Works. Method statements which adequately demonstrate the Contractor's proposed method of working, methods of maintaining safety and compliance with the programme shall be submitted for the Engineer's approval prior to the commencement of work on any area of the Site.

Where the Contractor is responsible for the preparation of Construction Documents to describe the permanent works such Construction, the Documents shall be approved prior to the procurement of any materials or commencement of any work to which the documents relate.

No materials, Plant or equipment shall be procured for the Contract and no work, permanent or temporary, shall commence without first obtaining the Engineer's approval. All materials, Plant and equipment supplied shall be designed for operation under the above described conditions.

2. Construction Documents

Drawings and Documents which are to be submitted by the Contractor to describe the Permanent Works shall become Construction Documents upon their approval.
All drawings, technical specifications, bill of quantities, schedules, cost estimates; programme and other information to be submitted by the contractor shall be in English and shall be submitted for approval in triplicate. Following approval, the contractor shall supply a further five copies to the Engineer. Construction Documents shall not be departed from without the approval of the Engineer.

All drawings and documents submitted by the Contractor shall have been checked, signed and be ready for issue and shall bear:

- Title of the drawing or document;
- Scale;
- Date;
- Work item reference number complying with an approved numbering system;
- Name and references of the Contractor;
- Names of the employer and the Engineer;
- Date of approval by the Contractor and the signature of the person responsible for approval.

Drawings and documents submitted for approval shall be delivered to the Engineer's office as designated by the Engineer.

Unless otherwise specified the Contractor shall allow a minimum of 21 days, after the date of receipt by the Engineer for approval of drawings and documents by the Engineer.

3. Operation and Maintenance Manuals

The Contractor shall submit to the Engineer for approval six copies of the Operation and Maintenance (O&M) Manuals as described in Clause 4.1 of the Particular Conditions of Contract.

The Contractor shall supply the final version of the O&M Manuals prior to the issue of the Taking-Over Certificate for either the whole of the Works or the respective Section or part of the Works. Each set shall be bound together in a stout plastic or other approved cover.

O&M Manuals shall be supplied written in English language, all parts and equipment listings shall be in English.

4. Level Datum

Before the commencement of constructional work the Contractor shall establish, in a position to the approval of the Engineer, steel datum pegs which shall be securely concreted in. The level of these pegs shall be established and agreed with the Engineer and all levels used in the construction of the Works shall be referred to these established datum points. The correctness of this datum shall be checked at regular intervals during the construction period as agreed with the Engineer.

Where possible construction drawings and all levels used for construction shall be referred to the national height datum as defined by the Survey of Kenya. The Contractor shall be responsible for obtaining the location and values of the permanent bench marks. In cases where such bench marks do not exist, the site datum shall be agreed with the Engineer.

5. Setting Out of the Works

The site layout drawings show indicative site layouts. Prior to commencing construction, the Engineer will agree with the Contractor the basic information supplementary to that shown on the Drawings such as the position of manholes, chambers, centre-lines and base-lines sufficient for the Contractor to locate the Works.

The Contactor shall prepare detailed setting out drawings and data sheets as necessary and submit them to the Engineer in triplicate for approval. Any modifications to the setting out drawings or data sheets required by the Engineer shall be made by the Contractor and resubmitted for final approval. Should it be necessary during setting out or during construction for the approved setting out details to be amended, the Contractor shall amend the drawings or data sheets or make new ones for approval as required by the Engineer.

For pipelines, the Contractor shall in the presence of the Engineer set-out the pipeline alignments in accordance with the indicative alignments shown on the drawings taking into account physical features on the ground, any existing services, any requirements of relevant Authorities and any changes deemed necessary by the Engineer, confirming the locations of all valves, air valves, washouts, hydrants and bends.

The Contractor shall prepare and submit to the Engineer, at an approved scale, plans of the pipeline route and profiles of ground levels after any initial clearing of the way leave or easement showing the proposed pipe invert levels and precise Chainages for all valves and

fittings for approval. Following approval the Contractor shall submit to the Engineer two copies of the agreed alignment and profiles.

6. Boundaries of Works

The Employer shall provide the Site upon which the Permanent Works are to be constructed. Where a drain or pipeline is to be within an existing road or track reservation or is otherwise located in land designated Public Domain the Site width will be restricted to the limit of the public land. The existing boundary fences and walls shall not be disturbed without prior approval of the Engineer and, unless road diversions and closure notices are approved and posted, carriageways shall be left available for the safe passage of traffic.
The Contractor shall not enter upon or occupy with men, tools, equipment or materials any land other than the site without the written consent of the owner of such land.
On occupation of the Site or other land the Contractor shall provide such fencing, as required.

7. Work through Private Land

In order that the necessary parts of the Site which are on private land may be obtained the Contractor shall supply the Engineer with full information of his programme sufficiently in advance of the dates upon which the Contractor proposes to enter upon each areas of the Site. The Contractor shall where required, in consultation with the Engineer, programme the Works to designate the areas of the Site to which the Contractor is to be given possession and the sequence of taking possession.

The Contractor shall obtain written approval before entering upon any private land or cutting through ditch, bank, hedge, wall, fence or any other form of boundary marking and he shall carry out all reasonable requirements as approved by the Engineer in the matter of reinstatement.

8. Public Utility Mains and Services

Where the Contract indicates the positions of existing services or apparatus the positions shown are believed to be correct but no warranty is given as to the accuracy or completeness of the information.
It shall be the responsibility of the Contractor to obtain all information available from the Public Utility Authorities regarding the position of existing mains and services and he shall copy this information to the Engineer as soon as he obtains it.
The Contractor shall carry out excavation works in a manner which safeguards any existing services, including hand excavation as necessary and shall be responsible for the cost of any repair work necessitated by damage caused by him to any main or service and for any costs arising from the disruption.

The Contractor shall obtain all information and assistance from the Public Utility Authorities for the locating of the mains and services and shall agree with the Engineer any trial excavation which may be necessary to confirm or establish these locations.

The Contractor shall be responsible for locating all existing services, whether known to the Public Utility Authorities or not, and shall conduct his own survey as necessary to accurately locate all services. All efforts to identify these existing services shall be carried out in advance of conducting excavation for the permanent works.
Any temporary or permanent diversion of mains and services shall be agreed with the appropriate Authority.

9. Safeguards to Existing Pipes, Cables, Structures

It shall be the Contractor's responsibility to safeguard by means of temporary or permanent supports or otherwise all existing sewers, pipes, cables, structures or other things which would be liable to suffer damage if such precautionary measures were not taken.
Safeguards shall be to the approval of the Engineer and of the undertaker or owner concerned.

10. Record Drawings

At all sites and any locations where the Contractor executes work under the Contract, including locations where the Contractor undertakes repair or rehabilitation work, the Contractor shall record the location and nature of all water supply and wastewater works including their ancillaries and any associated services.

Where instructed by the Engineer for the purpose of producing Record Drawings, the Contractor shall undertake such surveys and investigations to determine the location of existing services. Such surveys and investigations shall be additional to those surveys and investigations undertaken by the Contractor for the purpose of determining the location of services prior to excavation.

The Contractor shall where necessary utilize appropriate equipment and where instructed by the Engineer excavate trial pits to confirm the location and determine the size and nature of the buried services.

For sites where the Contractor undertakes permanent works Record Drawings shall be submitted to the Engineer, for approval, in the form of As Built Drawings. In the case of repairs and rehabilitation the Record Drawings shall be submitted for approval within a period of 21 days following execution of the work.
Record Drawings shall be prepared to an approved format, and scale in line with the construction drawing.

11. Connections to Existing Pipes, Cables and Equipment

The Contractor shall be responsible for joining up and making connections between pipes and cables laid by him and existing pipes and cables. The Contractor shall submit to the Engineer a drawing showing the details of the connection, and shall state the date on which the particular connection is required, and the work shall not proceed until the Engineer's approval has been given.

The Contractor shall be responsible for ensuring the compatibility of new pipes and cables with existing pipe work, cables, tubing and equipment.

12. Lighting, Watching and Traffic Control

Where necessary for safety of the public or where required by the Engineer, the Works shall be properly fenced and signed. In addition, the Works shall be lighted from half an hour before sunset until half-an-hour after sunrise and at other times when visibility is poor. The position and number of the lamps shall be such that the extent and position of the Works are clearly defined. Each Site shall be provided with watchmen as required.

13. Contractor's Offices

The Contractor shall provide and maintain offices for the use of his representative and staff to which written instructions by the Engineer can be delivered. Any instructions delivered to such offices shall be deemed to have been delivered to the Contractor.
Offices shall be located to give convenient access to the Works and shall be subject to the approval of the Engineer. The Contractor shall be responsible for obtaining the land on which to establish any temporary site offices.

14. Contractor's Yards, Stores and Accommodation for Workmen

The Contractor shall be responsible for obtaining the land and for the provision of all temporary yards, stores, workshops, offices, mess rooms, shelters and for all services in connection therewith. The location of all such facilities shall be agreed beforehand with the Engineer and shall be such as to avoid obstruction and nuisance to the public.
The Contractor shall construct secure storage compounds and storage building where he shall store at his own risk all equipment and Plant awaiting erection. The Contractor shall also provide secure covered storage for all samples submitted to the Engineer for approval. Storage building shall be weatherproof and shall be of sufficient size to accommodate all items requiring covered storage.

The Contractor shall provide and maintain suitable and sufficient shelters and mess rooms for his workmen and supervisory staff as are customary and necessary. The Contractor shall provide sufficient closets or latrines to the satisfaction of the relevant authority. They shall be properly screened and maintained in a clean and sanitary state at all times. The Contractor shall be responsible for making all arrangements for the proper disposal of waste.

15. Water and Electricity Supplies

The Contractor shall make all arrangements for and provide adequate supply of potable water to each site as necessary for the execution and testing of the Works and for use by his workmen.

The Contractor shall make arrangements for and provide any electricity supply required for the execution of the Works, including the Tests on Completion.

16. Contractor's Staff and Workmen

The Contractor shall agree to employ Kenyan workers to the maximum extent possible. The Contractor shall provide a competent Site Agent to the approval of the Engineer to be in charge of the work who shall not be changed except with the consent of the Engineer.
The Contractor agrees that his workmen and employees shall be considered for all purposes in his direct pay and employ and under his supervision and control. He shall be directly and personally responsible for discharging all obligations, financial or other, which may be or becoming owing to any such workman or employee or to his successors, assignees or personal representatives. There shall be no contractual or legal relations of any kind whatsoever between the Employer and any such workman, employee or any person employed in the performance of the Contractor's obligations under this Contract.

The Engineer may request and the Contractor agrees to accept the request for the immediate removal from the site of any employee or worker of the Contractor adjudged by the Engineer to be incompetent, disorderly, and unreliable or of bad character. Such employee shall not again be employed on the Works.

17. Training of Employers Workmen

The Contractor shall make provision for the on-site training of up to 3 of the Employer's staff.

18. Project Management

18.1 Project Control

The Contractor shall provide within his site organization a project management capability to advice and be directly responsible to the Site Agent. (Contractor's chief site representative) The duties of the section shall include the following:

a) Planning and programme preparation particularly in relation to the requirements of the Employer and the public authorities, and the requirements to maintain water supply and waste water disposal services where careful detailed arrangements have to be made and adhered to.

b) Planning the execution of the Works in a manner which minimizes disruption to the water supply system and will permit the efficient and effective commissioning of the water supply system and their respective components.

c) Ensuring adequate potable water supplies and wastewater disposal services are maintained to all consumers.

d) Continuous surveillance of progress and anticipation of factors likely to affect the timely performance of the Contract.

e) Making proposal for modification to forward planning and to the programme at an early stage in the light of factors resulting from (d) above.

f) Continuous appraisal of the Contractor's methods and routines particularly as to their effect on the community and property.

g) Forward planning for resource requirements taking due account of possible shortages and delays in the arrival on site of materials, equipment, plant and personnel and their mobilization for effective usage.

h) Acquisition and process of up-to-date information for progress meetings with the Engineer. The preparation of monthly progress reports including an update of the detailed programme and cash flow forecast which shall include progress photographs as directed by the Engineer.

The Contractor's project management staff shall be of adequate ability and experience. Programmes shall be based upon Critical Path Management (CPM) networks in precedence format and shall be prepared using a suitable PC-based project management software package approved by the Engineer.

Reporting shall be in a manner compatible with the Employers project management procedures and shall use the Earned Value (EV) Technique and shall monitor the actual gross value of work completed against the predicted value.

18.2 Monthly Statements and Certificates

Monthly statements and certificates shall be submitted in an approved manner and format. In addition to the statements submitted in hard copy the Contractor shall submit a computer copy using data base software as prescribed by the Engineer. The statements and certificates shall detail the measured value of the work completed on each item of the Works in such detail that the Engineer can identify location and measurement of each item. A location shall constitute a single structure such as a reservoir, pump station or section of a pipeline or a component of a system such as a pipeline valve complex.
Each item shall be uniquely identified in accordance with the numbering system as instructed by the Engineer.

18.3 Progress Meetings

The Contractor shall provide a suitable venue, near the vicinity of the Site, and arrange progress review meetings to be chaired by the Engineer at monthly intervals to coincide with submission of monthly progress submissions. The Contractor shall allow for attendance by the Engineer and up to 4 representatives of the Engineer's or Employer. The meetings shall be attended by the Contractor's senior representatives, Site Agent and other members of his senior staff as may be deemed necessary.

19. Equipment for the Employer

The Contractor shall hand over to the Employer on completion of the Works a complete set of tools and equipment together with spare parts and fittings to facilitate the maintenance and operation of the installed works.

20. Facilities for Survey and Inspection by the Engineer

The Contractor shall make available technicians and such labour, materials and safety equipment as the Engineer may require for inspections and survey work in connection with the Works. The Contractor shall provide all necessary tackle, test equipment, access, labour, staff and any other thing the Engineer may reasonably require in order that he may safely, conveniently and quickly carry out such inspections as he deems necessary at any time during the execution of the Works and during the Defects Liability Period. The Engineer, his representative and assistants, shall not inspect any area of the Works where they deem the safety provision to be inadequate and the Contractor shall undertake any work required by the Engineer in order to make it safe.

21. Inspections by the Engineer during Defects Liability Period

The Engineer will give the Contractor due notice of his intention to carry out any inspections during the Defects Liability Period and the Contractor shall thereupon arrange for a responsible representative to be present at the times and dates named by the Engineer. This representative shall render all necessary assistance and shall record all matters and things to which his attention is directed by the Engineer.

22. Protective Clothing and Safety Equipment

The Contractor shall provide for the Engineer, his Representative and assistants any additional protective clothing and safety equipment necessary for the proper discharge of their duties on the Site.
The Contractor shall provide any necessary protective clothing and safety equipment for the use of authorized visitors to the site including the Employer and his staff and representatives and those of any relevant authority who have reason to visit the Site.

23. Notice Boards

The Contractor shall provide and erect sign boards at the Sites where works are being executed, giving information to the public on the Project and the Employer and further details as will be prescribed by the Employer. The location of the sign boards at the sites will be indicated by the Engineer. The Contractor shall maintain, alter, move or adapt the sign boards from time to time as may be instructed by the Engineer. The display of any named Sub-contractors or any other information associated with the Works shall be to the approval of the Engineer.

24. Language of Correspondence and Records

All communications from the Contractor to the Engineer shall be in the English language. All books, timesheets, records, notes, drawings, documents, specifications and manufacturers' literature shall be in the English language. If any of the aforementioned is in another language a certified translation in English shall be submitted to the Engineer.

25. Standards and Regulations

Each and every part of the Works shall be designed, constructed, manufactured, tested and installed in accordance with an internationally recognized standard, Code of Practice, or Regulation applicable to that part of the Works.
Such standards and codes shall include:

a) British Standard Specification last published.
b) International Electromechanical Commission, where available (IEC).
c) International Organization for Standardization (ISO).

The Contractor shall provide and keep permanently on site copies of such standards as may be directed by the Engineer and shall make them available to the Engineer as required.

26. Equivalency of Standards and Codes

Wherever reference is made in the Contract, including Specifications, Drawings and Bill of Quantities, to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise stated in the Contract. Where such standards and codes are national, or relate to a particular country or region, other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified will be accepted subject to the Engineer's prior review and written consent. In the event the Engineer determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the Contract.

27. Quality Control

The Contractor shall be responsible for his own quality control and shall provide sufficient competent personnel for supervising the Works, taking and preparing samples and for carrying out all necessary tests.

28. Units

The International System of (metric) Units as set out in ASTM E380 shall be used throughout the Contract except where otherwise provided.

29. Inspection and Testing during Manufacture

The performance of each item of Plant or Pipe shall be tested in accordance with the Specification to the requirements of the Engineer.
Test certificates in triplicate shall be submitted by the Contractor to the Engineer within 2 weeks of the date of the tests. Type tests are not acceptable. Test certificates shall be supplied for tests carried out on the actual Plant being supplied.
Plant shall not be dispatched from the manufacturer's works until it has passed the specified tests and approval been given by the Engineer.

The Engineer shall at his discretion witness tests of individual items of Plant at the manufacturer's works. The Engineer shall be given a three week notice in writing before such tests are to take place.
The acceptance by the Engineer of any item of Plant or equipment after testing at the manufacturer's works shall in no way relieve the Contractor of his responsibility for the correct performance.

SECTION 2 - EARTHWORKS, BACKFILLING AND RESTORATION

1. Conditions of Site

Before carrying out work on any Site, the Site shall be inspected by the Contractor in conjunction with the Engineer to establish its general condition which shall be agreed and recorded in writing and by means of digital photography.

Details recorded shall include the location of all boundary and survey beacons, the condition of buildings, surface, terracing (if any), ditches, watercourses, roads, tracks, fences and other information relating to the Site and elsewhere which may be affected by the works.

In the case of way leaves for pipelines the boundaries of the way leave will be defined by the Employer and the contractor shall where directed provide erect and maintain in position, from commencement to the final completion of the Works, in every section substantial timber stakes or similar approved markers not less than 1.5 m high indicating the position of the boundary at 100m or other such intervals as the Engineer may direct. In the event of any boundary or survey mark established for the purpose of land title being disturbed or displaced the Contractor shall forthwith replace the beacon. Where necessary the Contactor shall employ the services of an approved licensed surveyor for the purpose of setting out boundaries.

2. Site Clearance and Topsoil Removal

Site clearance shall be carried out over the areas to be occupied by the Permanent Works before beginning excavation or filling or other work, and shall include the clearance of all trees, stumps, bushes and other vegetation and the removal of all boulders between 0.01 and 0.2m^3 volumes. Boulders located within 1m of any pipe centerline shall be removed where directed by the Engineer.

Before beginning clearance in any area the Contractor shall give seven days written notice of his intention to the Engineer who will determine the extent and limits of such clearance.

Topsoil shall mean the surface layer of soil which by its humus content supports vegetation and is unsuitable, as a formation to roads and concrete structures or as a backfill or bedding material. The extent and depth of topsoil that needs removal shall be agreed with the Engineer. Topsoil shall be set aside for re-use or disposal as directed by the Engineer.

Trees to be removed shall be uprooted or cut down as near to the ground level as possible. Bushes, undergrowth, small trees stumps and tree roots shall, where directed by the Engineer, be grubbed out. All holes left by the stumps or roots shall be backfilled with suitable material in a manner approved by the Engineer.

The Engineer may require that individual trees, shrubs and hedges are preserved; the Contractor shall take all necessary precautions to prevent their damage.
In the case of way leaves for pipelines and the like, the Contractor shall preserve as far as practicable all grass and other vegetation outside the limits of trenches and permanent works and shall not necessarily destroy crops or any vegetation whose removal would not be essential to his operations.

3. Erosion

The Contractor shall take care at all times to prevent erosion on every site and elsewhere on land which may be affected by his operations and the Engineer may impose such reasonable

limitations and restrictions upon the method of clearance and upon the timing and season of the year when clearance is carried out as the circumstances warrant.

4. Ground Levels

Before commencement of any earthworks or demolition the sites shall be surveyed, as necessary, in conjunction with the Engineer to establish existing ground levels. These agreed ground levels shall form the basis for the calculation of any subsequent excavation and filling.

5. Trial Holes

The Contractor shall excavate refill and restore in advance of his programme such trial holes as he may require for determining the nature of the subsoil and the location of existing underground services and obstructions.

6. Excavation Generally

Excavations shall be made in open cutting unless tunneling or heading is specified or approved by the Engineer and shall be taken out as nearly as possible to exact dimensions and levels so that minimum of infilling will afterwards be necessary. The Contractor shall ensure the stability and safety of excavations and shall take all measures necessary to ensure that no collapse or subsidence occurs.

Except where described in the Contract or permitted under the Contract excavation shall not be battered. The sides of all excavations shall be kept true and shall where necessary be adequately supported by means of timber, steel or other type struts, walling, poling boards, sheeting, bracing and the like.
Excavations shall be kept free from water and it shall be the Contractor's responsibility to construct and maintain temporary diversion and drainage works and to carry out pumping and to take all measures necessary to comply with this requirement.
In the event of soft or otherwise unsuitable ground being encountered at formation level or if the formation is damaged or allowed to deteriorate the Contractor shall forthwith inform the Engineer, shall excavate to such extra depth and refill with compacted granular or other approved fill or C15 concrete (minimum compressor strength 15N/mm2) as the Engineer may require. With respect to the side face of any excavation against which concrete or other work will be in contact the Engineer may require that the net dimensions of the work be increased.
The Contractor shall be responsible for the disposal of Surplus excavated material off site, which shall be to a location approved by the Engineer. No excavated material suitable for re-use shall be removed without the approval of the Engineer.
The Contractor shall not deposit excavated materials on public or private land except where directed by the Engineer or with the consent in writing of the relevant authority or of the owner or responsible representative of the owner of such land and only then in those places and under such conditions as the relevant authority, owner or responsible representative may prescribe.

7. Excavation in Excess

If any part of any excavation is in error excavated deeper and/or wider than is required the extra depth and/or width shall be filled with Grade C15P concrete or compacted granular or other approved fill to the original formation level and/or dimensions as the Engineer directs.
In pipe trenches where the pipe is not bedded on or surrounded with concrete, excess excavation shall be filled with compacted granular material. Excess excavation in rock

trenches shall be filled with concrete (15N/mm2 compressive strength) up to 150mm below the pipe invert.

8. Mechanical Excavation

Mechanical excavation shall be employed only if the subsoil is suitable and only in such manner which will allow adequate support of the excavations. The Contractor shall ensure that there are no pipes, cables, mains or other services or property which may be disturbed or damaged by its use.

9. Excavation for Pipe laying

The width of trench excavation shall be the minimum required for efficient working after allowance has been made for any timbering and strutting, and shall not exceed the widths described in the Contract. At any one spread the maximum length of open trench shall not, without the prior approval of the Engineer, exceed 100 metres.

Trenches in rock for pipes up to 100mm bore shall be excavated to provide a minimum clearance of 100 mm and a maximum of 300 mm around the outside of the pipe and joints. For pipes exceeding 100mm bore the minimum clearance shall be increased to 150mm and a maximum of 400mm.
Where the trench is in rock or rocky ground the Contractor shall excavate the pipe trench to a depth of 150mm below the invert of the pipe and refill with compacted granular fill.
The materials for re-use excavated from trenches shall be stockpiled at the sides of the trench except where this would obstruct any road or footpath and prevent the passage of traffic or pedestrians. In such cases the Contractor shall excavate the trench in such lengths and stockpile the excavated materials at such places as the Engineer may require.

Where excavation for pipe laying is carried out behind thrust blocks on existing pipelines the Contractor shall provide adequate support arrangements to transfer thrusts to the surrounding ground.

10. Headings

Excavation for pipes in heading shall be carried out to the approval of the Engineer and to dimensions which will permit a proper inspection to be made. The heading shall be properly and securely timbered. The pipe shall be laid on a minimum thickness of 150mm of concrete. After the pipe has been laid, jointed and tested the heading shall be filled in short lengths not exceeding 1 metre with Grade C15P concrete or as directed. The heading shall be completely filled with concrete and hard filling shall then be rammed into the concrete at the crown of the heading.
Special precautions shall be taken to prevent a slump in the concrete and to ensure that no slips or falls of the heading or in the ground above or in the shafts can take place.

11. Excavation for Foundations of Structures

The Contractor shall give sufficient notice to the Engineer to enable him to inspect and approve foundations in advance of placement of the permanent works. The Engineer may withdraw his approval if work is not commenced within 48 hours or the formation is subsequently allowed to deteriorate.

If the Engineer directs a bottom layer of excavation of not less than 75mm thickness shall be left undisturbed and subsequently taken out by hand immediately before concrete or other work is placed.
Formations which are to receive concrete blinding or a drainage layer shall be covered with such blinding or layer immediately the excavation has been completed, inspected and approved by the Engineer.
Surfaces against which permanent works are to be placed shall be kept free of oil, water, mud or any material.

No concrete or other materials shall be placed until formations have been approved. Adequate notice shall be given to the Engineer to enable him to examine the formation.

12. Rock Surfaces under Concrete Structures

12.1 Concrete Placed Directly on Rock

Rock under concrete structures shall be prepared by picking, barring and wedging or other methods which will leave the rock in as sound a condition as may reasonably be expected according to the rock quality.
Rock surfaces shall be thoroughly cleaned by compressed air and water jet or such means as the Engineer my direct before concrete is placed.

12.2 Concrete Placed on Capping Layer

Where instructed the rock excavation shall be taken down to a depth of 1.0m below the underside of the structure and the excavation backfilled with capping materials to the required formation level. Capping material shall be granular material. The material shall be compacted in 150mm layers to achieve a density of not less than 95% maximum dry density at optimum moisture content + 5% to 2% as determined by the BS heavy compaction tests to BS 1377.

13. Excavated Materials Suitable for Re-use

In so far as they are suitable and comply with the Specification, materials arising from excavations shall be re-used in the Works.
During excavation, the Contractor shall ensure that all material suitable for re-use are kept separate and set aside and protected as necessary to prevent loss or deterioration.

The materials forming the surface and foundations of roads, road verges, tracks and footways shall when excavated, and if required for further use, be carefully separated. All hard materials shall be kept free from soil or other excavated materials.
During excavation of pipe trenches the Contractor shall ensure that all granular or other approved material suitable for filling around and over pipes shall be kept separate and re-used for this purpose.

Paving slabs, bricks and similar surfaces shall be carefully removed and stacked. Prior to the commencement of excavation the number of badly broken and unsuitable paving slabs, bricks etc. on the line of the excavations shall be agreed with the Engineer.
In verges and other grass surfaces the grass and top soil shall be stripped and separately stacked.

14. Backfilling of Excavations

Backfilling shall be thoroughly compacted in layers not exceeding 150mm compacted thickness and by means which will not damage the Works.
Backfilling of reinforced concrete structures shall be with suitable material approved by the Engineer.
"Granular material" as backfill is defined as unconsolidated quarry dust, gravel, sand or similar in which the clay or silt content is not predominant. The use of angular crushed stone shall not be permitted.

15. Pipe Beddings

Unless otherwise specified granular material for beddings shall consist of aggregate to BS EN 12620 and shall conform to the following grading.

Pipe Nominal Diameter (mm)	Max Size (mm)	Grading (mm)
<50	Sand	N/A
50	10	10 single-size
80	10	10 single-size
100	10	10 single-size
150	15	10 or 14 single-size or 14 to 5 graded
200 to500	20	10, 14 or 20 single-sized or 14 to 5 graded or 20 to 5 graded
<500	40	10,14 20 or single-size crushed rock or 14 to 5 graded or 20 to 5 graded or 40 to 5 graded

Granular bedding material where specified shall have a Compaction Fraction not greater than 0.3 as ascertained by the test method described below.

Aggregates for flexible pipes shall consist of sub-rounded or rounded material which will not cause damage to or penetrate the pipe material.

Sand bedding material shall consist of approved local sand which material shall have a Compaction Fraction ascertained by the test method described below of not greater than 0.3.
Class A bedding shall consist of Grade C15P concrete bed and surround.

Class A1 bedding shall comprise a 120 degrees cradle of Grade C15P in situ un-reinforced concrete under the pipe with selected backfill material to a depth of 300mm above the crown of the pipe.

Class B bedding shall comprise a 180 degrees bed of single-size granular material in accordance with the above table, with selected backfill material to a depth of 300mm above the crown of the pipe.
Class S bedding shall comprise a complete surround of granular material in accordance with the above table to a depth of 150mm above the crown of the pipe.

Class D bedding shall comprise a hand-trimmed natural bottom to the trench with selected backfill material placed around and over the pipe to a depth of 300mm above the crown of the pipe.

Granular bedding and selected backfill material, placed around and to a thickness of 300mm above the crown of the pipes shall be placed simultaneously on both sides of the pipe in layers not exceeding 150mm thickness and compacted by the use of hand rammers taking particular care to compact the material under barrel of the pipe and around joints.

In trenches where there is a continuous accumulation of groundwater, the trench shall after obtaining the approval of the Engineer, be over-excavated by 150mm and shall be backfilled using compacted granular material in accordance with the above table.

If the quantity of suitable material which can be obtained from the excavations is insufficient, the Contractor shall either screen the excavated material or transport suitable material from other excavated or borrow pits on the Site. In cases where insufficient material exists on the Site, the Contractor shall import suitable material after obtaining the written approval of the Engineer.

16. Compaction Fraction Test

17.1 Apparatus required:

1) Open-ended cylinder 250 mm long and 150mm ± 5mm internal diameter (150mm diameter pipe is suitable);
2) Metal hammer with striking face 38 mm diameter and weighing 1 kg.
3) Rule.

17.2 Method

Obtain a representative sample, more than sufficient to fill the cylinder (viz. about 10kg). It is important that the moisture content of the sample should not differ from that of the main body of material at the time of its use in the trench.

Place the cylinder on a firm flat surface and gently pour the sample material into it, loosely and without tamping. Strike off the top surface level with the top of the cylinder and remove all surplus material. Lift the cylinder up clear of its contents and place on a fresh area of flat surface. Place about one quarter of the material back in the cylinder and tamp vigorously until no further compaction can be obtained. Repeat with the second quarter, tamping as before, and so on for the third and fourth quarters, tamping the final surface as level as possible.

Measure down from the top of the cylinder to the surface of the compacted material. This distance in millimetres divided by the height of the cylinder (250mm) is the Compaction Fraction of the material under test.
To obtain a representative sample about 50kg of the proposed material should be heaped on a clear surface and divided with the spade down the middle into two halves. One of these should then be similarly divided, and so on until the required weight sample is left.

17. Selected Backfill Material

Backfill in contact with the pipes shall be selected material and shall not contain larges stones, rocks, tree roots or similar objects which through impact or by concentrating imposed

loads might damage the pipes. The material shall be capable of being compacted without the use of heavy rammers and should be free of clay lumps or other material larger than 745mm or stones larger than the maximum particle size specified for pipe bedding.

19 Backfilling of Pipe Trenches

The trench above pipe bedding level (300mm above the crown of the pipe) shall be filled with the approved back fill material obtained from the trench excavations, free from clay limps, boulders and rock fragments larger than 150mm.
If the quantity of material which can be obtained from the pipe trench excavation is insufficient, the Contractor shall either screen the excavated material or transport suitable material from other excavations or borrow pits on the Site. In cases where insufficient material exists on the Site, the Contractor shall import suitable material after obtaining the written approval of the Engineer.

The material shall be placed in layers not exceeding 150mm thickness and compacted by the use of rammers to achieve a density of not less than 95% maximum density at optimum moisture content +5% to -2% as determined by the BS Heavy Compaction Test to BS 1377.
For trenches in fields and open areas where agreed by the Engineer the trench backfill shall be compacted to obtain a density of not less than 85% maximum dry density at optimum moisture content +5% to -2% as determined by the BS Heavy Compaction Test to BS 1377.
The density of the compacted fill shall be determined by the Contractor using the "sand replacement" method as directed by the Engineer.
Before backfilling trenches the Contractor shall obtain approval from the Engineer of the methods he proposes to use and shall demonstrate by means of tests that the specified compaction can be achieved. The method of compaction shall at all times be to the approval of the Engineer.
Where ground water conditions are such that the bedding material would be likely to act as a carrier for ground water from higher of lower ground, the Engineer may instruct flow barriers of suitable selected earth or concrete to be inserted in lieu of bedding material. Such barriers to be erected at reasonable intervals close to flexible joints in the pipe.

19.1 Excavation protection by warning marker tapes

All foundations or pipe trenches shall be protected from future damage arising from excavations. This shall be achieved by use of brightly pigmented detectable pipe marker tapes made from aluminum and polyethylene strips with tensile strength of 50N/mm2. The tapes shall be laid above the excavated site at depth not exceeding 450mm and not less than 600 above the trenches. They shall be inert to acids and alkalis and retain their pigmentation and markings for at least 50 years. The contractor shall provide evidence of quality compliance from the manufacturer. The marker tapes shall carry the message specified in the BOQs.

19.2 Making Good Subsidence after Backfilling

Backfilling, whether in foundations or in pipe trenches, shall be thoroughly compacted by ramming and any subsidence due to consolidation shall be made up with extra compacted material.
Should subsidence occur after any surface reinstatement has been completed the surface reinstatement shall first be removed, the hollows made up, and then the surface reinstatement re-laid.
Any subsidence that occurs adjacent to the Site of the Works which is attributable to the Contractor's activities shall be reinstated to the full satisfaction of the Engineer.

20 Removal of Timbering from Excavations

Timbering shall be removed from the excavations before or during the process of backfilling except in so far as this removal of timber would be likely to cause damage to adjacent property, structures or structure foundations in which event the Contractor shall leave in the excavation such timbering as he considers necessary or as may be ordered by the Engineer.

21 Reinstatement of Surfaces

All surfaces whether public or private that are affected by the Works shall be reinstated temporarily in the first instance and when the ground has consolidated fully the Contractor shall reinstate the surfaces permanently.

Temporary reinstatement and permanent reinstatement of all surfaces, affected by the operations of the Contractor shall be carried out and maintained to the satisfaction of the Engineer and the responsible authority or owner.
Temporary reinstatement shall be carried out immediately the trenches are backfilled. Permanent reinstatement shall not be carried out until the ground has consolidated completely. The Contractor shall inform the Engineer before carrying out this work. In the event of further settlement occurring after completion of the permanent reinstatement the Contractor shall forthwith make good the reinstatement to the approval of the Engineer or responsible authority.
For the purpose of temporary and permanent reinstatement in bitumen and surfaced roads the surface width of trenches shall be increased by 150mm on each side of the trench for a depth of 75mm to provide a solid abutment for the surfacing material.

In verges and other grass surfaces and after the backfilling had been thoroughly consolidated the topsoil shall be re-laid rolled and planted with grass or other vegetation as directed by the Engineer as may be necessary and watered until the grass has become well established. Should the planting fail it shall be replanted as required until satisfactory growth is obtained. If at any time any reinstatement deteriorates the Contractor shall restore it to a proper condition immediately.
Should the Contractor not remedy the defect to the Engineer's satisfaction forthwith any remedial work considered necessary may be undertaken by the Employer and/or the responsible authority at the Contractor's expense.
All trees, shrubs and plants shall be carefully transplanted and shall be returned to their original location after the refilling of the excavations. Return of old or mature trees may be waived in cases where the age of the tree makes return impracticable, and approved tree seedlings shall be planted in their place. Topsoil shall be carefully set aside and replaced at the surface of the backfilling.
The Foundation trenches shall be refilled and rammed solid as specified in the Contract and shall not be topped up above the original surface level to allow settlement.

If any trench becomes dangerous the Engineer may call upon the Contractor for its reinstatement at three hours' notice and failing this to have the work done by others at the Contractor's expense.

In the case of footpaths the trench shall be refilled and rammed as specified to within 125mm of the surface. A foundation layer of 100mm compacted thickness of approved crushed limestone shall then be laid and compacted. The surface shall be cleaned and primed and the footpath surfacing shall be temporarily reinstated with 25mm compacted thickness of 14 mm nominal size dense wearing course macadam laid and compacted so as to achieve a

dense, smooth and even course surface using a roller of 750 to 3000kg mass. Any kerbs shall be reinstated to their original condition.
This excavated surface shall be thus maintained until the end of the Period of Maintenance or permanent reinstatement is ordered by the Engineer. Where permanent reinstatement is ordered by the Engineer the temporary surface and part of the foundation shall be removed to 50mm depth to permit the construction of a tiled or paved surface to match the original surface. An approved tiled or paved surface shall then be laid and bedded on sand or mortar to an even finish.

22 Restoration of Borrow Areas, Spoil Tips and Quarries

Any spoil tips, quarries or other borrow area developed by the Contractor for the purpose of the Works shall be finished to safe and fair slopes to the approval of the Engineer.

23 Top soiling and Grassing

Where required surfaces shall be soiled with fine sifted soil or silt not less than 100 mm compacted thickness which shall be raked and brought to a fine tilth.

Surfaces required to be grassed shall be planted with approved local grass at a spacing of 200mm x 200mm. The grassed area shall be replanted if the first or subsequent operation is unfruitful or if for any reason the grass is destroyed. Grassed areas shall be watered and attended until the grass has become well established.
The soiling and planting of the grass in slopes shall be carried out immediately the slope is formed and the grass shall be kept weeded and cut until the work is accepted at the time of the Certificate of Completion.
The Contractor shall supply attendance during the Defects Liability Period to ensure that all planted grass is kept weeded and cut, and if necessary watered.

24 Free Draining Fill

Free draining fill for use as backing to wall shall consist of sound hard stone or broken rock or concrete derived from demolition of structures. The particles shall be roughly cubiform and shall be between 75mm and 25mm in size. All smaller particles, Dust, rubbish and organic matter shall be excluded.

25 Hardcore

Hardcore shall consist of sound hard stone or broken rock or concrete derived from excavations or demolition of structures and shall be graded from 150mm to 50mm in size, except that sufficient but not excessive blinding materials of smaller sizes may be permitted at the discretion of the Engineer.

SECTION 3A. CONCRETE WORKS – GENERAL

1. Scope

This Specification applies to structural concrete in small structures such as manholes, chambers and superstructure elements of small building works. This specification also applies to concrete in thrust blocks, blinding, supports, fill etc

2. Concrete

2.1 Classes

This Specification includes 4 grades of concrete

Grade CI5
Grade C20
Grade C25
Grade C30

The grade refers to the 28 day characteristic strength in N/mm2

2.2 Composition

The concrete composition shall generally conform to the requirements of the prescribed mix design, as set out in BS 5328 Tables I and 2. Small quantities of concrete may with the approval of the Engineer be batched in accordance with the Table 3.1 of Nominal Mixes

Table 3.1 Nominal Mixes

Grade of concrete	Approx. volume of Aggregate m^3 per m^3 concrete		Approx. cement per m^3 finished concrete in bags (each 50 kg)	Remarks
	Fine	Coarse		
Cl5	0.450	0. 900	5	Aggregate max. size to be 20 mm. Fine aggregate to Zone M of BS 882 Water not to exceed 28 litres per 50kg of Cement
C20	0.400	0.875	6	
C25	0.375	0.825	8	
C30	0.350	0.725	11	

2.3 Structural Concrete

Structural concrete shall be Grade C20, C25 or C30, as shown on the drawings. The cement content shall not be less than 320 kg per cubic metre and the water/cement ratio shall not exceed 0.55 (27.5 litres per 50 kg of cement). The slump shall be 50 mm +/- 15mm when tested to BS 1881.

Unless otherwise approved by the Engineer, the fine aggregate shall comply with Zone M or Zone F of BS 882. Coarse aggregate shall be 20 mm max size. The proportions of the mix shall be approximately as shown in the Tables 1 and 2 of BS 5328 but these proportions may be varied to obtain the specified strength requirements. Admixtures may not be used in ordinary structural concrete. A trial mix of the concrete to be used shall be made in the presence of the Engineer's Representative sufficiently in advance of the commencement of concreting to permit the 28 day compression test result of the cubes taken from the mix to the approved by the Engineer's Representatives. 28 day compression cube tests shall be carried out taking one sample for each 20 m^3 of concrete placed with a minimum of one sample per day. Three cubes are to be cast from each sample. If more than 5% of test results fall below the specified characteristic strength when tested to BS 1881, adjustments to the

mix shall be made in order to obtain the strength required and the Engineer may require concrete already placed to be made good as described in this Specification.

2.4 Cement

Cement for normal concrete shall be Ordinary Portland or Rapid Hardening cement to BS 12 or shall be CEMI-32.5, CEMII-32.5 or CEMIV-32.5 or higher strength grade in accordance with Kenya Standard KS 1725 Part 1 and Part 2. Cement for Sulphate resisting concrete shall be Sulphate resisting cement to BS 4027. Cement which is not fresh and dry before mixing shall not be used in the Works.

2.5 Water

Water shall be potable

2.6 Aggregates

Fine aggregate shall be clean natural sand. Coarse aggregate shall be crushed stone, washed gravel or other inert granular material as approved by the Engineer.
All aggregates shall comply with the requirements of BS 882 and grading curves shall be provided for all aggregates used.

3. Reinforcement

Reinforcement shall comply with BS 4449 and shall be bent in accordance with BS 4466. Fabric reinforcement shall be made from cold-drawn high tensile steel and shall comply with BS 4483. Reinforcement which is rusted shall be wire brushed before use to remove mill scale.

4. Formwork

4.1 Requirements

Formwork shall be accurately formed and shall be of sufficient strength and rigidity as to carry the weights and pressures of the concrete without deformation. It shall be tight so as to avoid the loss of grout and shall be clean and free from damage.
“Rough Finish Formwork" shall consist of sawn boards or sheet metal panels and shall only be used where specified in the Bill to produce a rough finish.

"Fair Finish Formwork" shall produce a high standard of finish. Where not otherwise specified in the Bill of Quantities this formwork shall be used throughout the Works. It shall consist of wrought timber boarding 40 mm thick tongued and grooved, or framed plywood, and arranged in a uniform pattern.

4.2 Striking and Removal of Formwork

Striking of formwork shall be carried out having regard for the climatic conditions prevailing, and shall be 'undertaken at the sole risk of the Contractor. Where premature removal of formwork takes place and deformation is apparent, with or without distress in the concrete, the work shall be made good as described in this Specification. The following striking' times are included as a guide for normal conditions and shall be treated as a minimum requirement:

Suspended Slabs	(props left under)	5 days
Ditto	(props removed)	10 days
Beam soffits	(props left under)	9 days
Ditto	(props removed)	19 days

Sides of beams, walls and columns		1 day

All exposed concrete arrises are to have 20mm x 20mm chamfer unless otherwise shown on the drawings.

5. Concreting

5.1 Requirements

The finished concrete shall be dense durable and free from cracks and honeycombing.

5.2 Mixing, Transporting and Placing

All concrete shall be made in a mechanical mixer. Concrete shall be placed within 30 minutes of completing the mixing or agitation. Mixing may be continued in the mixer or agitator up to a maximum period of 90 minutes and for not less than the period required to achieve an even consistency of the mix. All concrete shall be compacted by a mechanical vibrator and a slump test shall be carried out on each batch mixed, unless otherwise approved by the Engineer's Representative.

5.3 Concreting in difficult weather conditions

Concreting during hot or cold weather conditions shall comply with the established requirements of good practice. During wet weather adequate covering shall be provided to both materials and concrete.

5.4 Curing

All concrete shall be properly cured for 7 days, by wetting or by use of an approved curing membrane.

5.5 Finishes to Concrete

All exposed faces of concrete shall be hard, smooth and free from honeycombing and other blemishes. All projections shall be rubbed down with carborundum stone. The normal finish to slabs and screeds, unless otherwise specified, shall be formed by wood floating the accurately leveled or screeded surface.

5.6 Making Good

Any section of the work which, in the opinion of the Engineer, does not conform to the requirements or clear intent of this Specification, or to the requirements of established good practice, shall be made good or removed and replaced as directed by the Engineer at the expense of the Contractor.

5.7 Ready Mixed Concrete

Ready mixed concrete shall comply with the requirements of this Specification and to those other requirements of BS 5328 which do not conflict with the Specification.

5.8 Granolithic Concrete

Granolithic concrete shall conform to the recommendations laid down in the "Specification for Granolithic floor toppings laid on in-situ concrete" as published by the Cement and Concrete Association with special reference to monolithic construction.

5.9 Concrete Benching

Concrete benching shall consist of structural concrete, as herein specified, placed to a low workability and finished while still green with 50 mm Grade C25 fine concrete using a maximum aggregate size of 10 mm and steel trowelled to a smooth dense finish to the concrete contours.

5.10 Precast Concrete Units

5.10.1 Requirements

Precast concrete units, unless otherwise stated, shall be obtained from an approved manufacturer and shall be true to dimension and shape with true arises and with perfectly smooth exposed faces free from surface blemishes, air holes, crazing and other defects, whether developed before or after building-in. They shall comply with the appropriate BS. In addition, the following requirements particular to the various units shall be complied with:

5.10.2 Kerbs

Precast concrete kerb shall conform to BS 340, except that coarse aggregate shall conform to BS 882. Fine aggregate shall consist of sand resulting from the natural disintegration of rock. Approved air-entraining agents may be permitted to be used providing that approved adjustments are made to the mix with regard to water and fine aggregate proportions In such cases the moisture absorption limits set out in BS 340 may be neglected subject to the concrete satisfying an approved freeze-thaw test based on thirty cycles of exposure.

5.10.3 Flags

Flags shall conform to BS 368

5.10.4 Other Blocks

Blocks used for building work shall conform to BS 6073/2028.

SECTION 3B: CONCRETE REPAIR AND REHABILITATION

1. Scope

The work shall consist of removal of unsuitable concrete; surface and face preparation; forming; and furnishing, placing, finishing, and curing concrete repair material and Installation of embedded items into existing concrete.

All materials required to repair structures shall meet the following specification:

Aggregates shall conform to the requirements of Material Specification BS 882, Aggregates for Portland Cement Concrete, unless otherwise specified. The grading of coarse aggregates shall be as specified by the manufacturer of a proprietary repair material.

Portland cement shall conform to the requirements of Material Specification CEM II/B-V (which contains 21–35% fly ash) or CEM III/A (which contains 36–65% GGBS). (Composition, Specifications and conformity criteria for common cements) and Part 2 (conformity Evaluation), Portland cement, for the specified type. Only one brand of any type of cement shall be used in any single repair as defined by the manufacturer of a proprietary repair material.

Water used in mixing and curing of the concrete repair shall be clean and free from injurious amounts of oil, salt, acid, alkali, organic matter, or other deleterious substances.

Air-entraining admixtures shall conform to the requirements of Material Specification ASTM C 260, Chemical Admixtures for Concrete. If air-entraining cement is used, any additional air-entraining admixture shall be the same type as that in the cement.

Chemical admixtures for water-reducing, retarding, or water-reducing and retarding shall conform to the requirements of Material Specification ASTM C 494, Chemical Admixtures for Concrete.

Curing compound shall conform to the requirements of Material Specification ASTM Specification C 309, Concrete Curing Compound.

ShotCrete, Construction Specification ASTM C 33.

Proprietary concrete repair material shall be subject to review and approval of the engineer before use. The material shall meet all specified salient features for repair material and not react detrimentally with the existing concrete or associated member of the structure being repaired.

Replacement concrete repair material shall be a material that consists essentially of a binding medium of Portland cement and water that will meet all the specified salient features for repair material and not react detrimentally with the existing concrete or associated members of the structure being repaired. This may be, but is not limited to, a conventional concrete mix with or without admixtures, ShotCrete, preplaced aggregate concrete, or grout

2. Submittals

Submittals shall conform to all provisions and sections of these specifications. Submit manufacturer's product information, installation instructions and recommendations, and certification of compliance with required properties for all repair materials.

3. Repair Scope

Patch and fill openings in existing concrete indicated to be patched or filled.

Patch, fill holes in and otherwise repair damage to concrete and concrete surfaces resulting from removal of penetrating pipes and other embedded items, from installation of pipes or other items embedded in or passed through concrete, and from other construction activities.

Crack Repair: Repair the full length of cracks in concrete members in new structures, and in existing structures as follows:

Deteriorated Concrete:

I. Repair interior concrete surfaces showing signs of deterioration in the following existing structures:

II. The level of deterioration of the concrete varies within each of the listed structures.

4. Preparation of areas to be repaired

All loose, cracked or otherwise unsuitable or defective concrete shall be removed from the existing structure and the final extent of removal shall be determined by the engineer after inspection of prepared surfaces.

Feathered edges at the surface are not permitted. The surface edge of the repaired area shall be cut with a saw, drilled, or chipped to leave a sharp edge with a minimum of a 20mm depth face perpendicular to the face of the wall.

The top side of the repair hole shall be shaped to a uniform, fairly straight face that is sloped upward on a 25mm rise for each 75mm of depth of cut toward the face from which the repair material will be placed. The repair hole shall be conical in shape with the large end at the surface from which repair material will be placed.

The bottom and vertical or near vertical sides of the hole shall be cut sharply and approximately perpendicular to the face of the wall. All interior corners shall be rounded to a minimum radius of 25mm.

Where reinforcement is encountered, the concrete directly in contact with the sides of the reinforcement shall be removed to provide at least 25mm clear distance between the reinforcement and the in place concrete.

Before the concrete repair material is placed, all oil and grease shall be steam or solvent cleaned from all reinforcement and surfaces to which the repair material is required to bond. If solvent cleaning is used, solvents and solvent residue shall not impair the repair material or its bonding strengths.

After removal of all oil and grease, the reinforcement shall be cleaned to remove any loose, flaky rust, mill scale, and other coatings or foreign substances that would impair bonding of the repair material to the reinforcement. The prepared faces of the repair hole shall be cleaned by high pressure water jets or compressed air jetting with water to remove all loose particles and dust. The repair hole shall be free of chips, sawdust, debris, free water, ice, snow, or other harmful substances or coatings.

Where repair material manufacturer recommends use of an epoxy-bonding agent, follow recommendations of both the repair material and epoxy bonding agent manufacturers

The contractor shall ensure that repaired surfaces are fully consolidated completely filling all portions of areas to be filled.

Bring repair surfaces into alignment with adjacent existing surfaces to provide uniform, even surfaces. Unless indicated otherwise, repair surfaces shall match adjacent existing surfaces in texture and receive coatings or surface treatments provided for adjacent existing surfaces.

5. Treatment of Surface Defects

Surface Defects are depressions in concrete surfaces not extending all the way through a member, caused by physical damage, un-repaired rock pockets created during original placement, spalling due to corroded reinforcing steel or other embeds, or removal of embedded items or intersecting concrete members. The preparation procedure for such defects are follows:

Preparation Procedure;

I. Remove loose, damaged concrete by chipping to sound material.

II. Where existing reinforcing bars are exposed, remove concrete at least 25mm deep all around the exposed bars. If the existing bars are cut through, cracked, or cross-sectional area is reduced by more than 25 percent, notify the Owner's Representative immediately

Repair Material:

I. Use only repair mortar to repair surface defects in members normally in contact with water or soil, and defects in interior surfaces of structures which are intended to contain water.

II. Repair of other surface defects may be by application of repair mortar, repair concrete or cement grout, as appropriate.

6. Disposal

Unless otherwise specified, all concrete and other debris resulting from the repair works shall be removed from the site and disposed of at location(s) of the contractor's selection. The contractor is responsible for complying with all NEMA regulations pertaining to the disposal of such waste.

7. Selection of concrete repair material

Only one brand of proprietary concrete repair material shall be used in any single repair operation unless compatibility between brands can be proven with actual test or performance data.

A conventional concrete mix to be used as a replacement concrete repair material shall be ready-mix concrete that meets all the specified salient features for repair material and conforms to ASTM C94. Option A from section 5 of ASTM C94 shall apply.

The contractor is responsible for the selection and correct application of the concrete repair material. At least 14 days before installation, the contractor shall provide the engineer for approval all technical data for the repair material. The technical data shall include the design mix and test results to verify satisfactory conformance to the salient feature requirements. If a proprietary material is used, the manufacturer's recommended preparation, use, and installation specifications shall also be submitted 14 days before installation. Concrete repair material shall not be placed before approval.

Concrete repair material shall have the following salient features:

a. Be a cementitious material that after hardening will remain stable in wet and moist environments and will not dissolve in water.
b. A 28-day compressive strength of 27N/mm^2 or greater when tested according to ASTM C39, unless otherwise specified.
c. Bond strength of the repair material shall be tested in accordance with ASTM C882 procedures for type V material and shall have the minimum strength of 7N/mm^2 at 28 days unless otherwise specified.
d. Shall be suitable for application at the minimum temperature of 15^0 C
e. Shall not contain chlorides, added gypsum, added lime, or high alumina cements. Shall be noncombustible both before and after cure.
f. Color shall be concrete gray unless otherwise specified.
g. Shall not produce a vapor barrier material and shall be thermally compatible with concrete.
h. Shall have a freeze-thaw resistance equal to or greater than 27N/mm^2, air-entrained concrete designed for severe exposure conditions according to ACI Standard Practice 211.1, unless otherwise specified.
i. Shall exhibit no shrinkage at 28 days and no more than 0.4 percent expansion at 3, 14, or 28 days after placement when tested according to the procedures in Corps of Engineers Specification for Non-shrink Grout, CRD-C621.

8. Handling and measurement of material

For all types of repair material, the cementitious components shall be kept dry and protected from contamination until incorporated in the mix. Broken containers or bags of premeasured and premixed components will not be accepted.

Handling and measurement of conventional concrete mix repair material shall conform to ASTM C94.

Handling and measurement of prepackaged proprietary material shall follow the manufacturer's recommendations and requirements. Handling and measurement of components that are not prepackaged or premeasured shall be in accordance with the following requirements and the manufacturer's requirements. A copy of the manufacturer's written requirements will be provided to the engineer 14 days before installation. The handling and measurement requirements are:

- Aggregates shall be stored or stockpiled in such a manner that separation of coarse and fine particles of each size is avoided and that various sizes do not become intermixed

before proportioning. Methods of handling and transporting aggregates shall be such as to avoid contamination, excessive breakage, segregation or degradation, or intermingling of various sizes.

- Scales for weighing aggregates and repair material components shall be beam type, electronic, or spring- less dial type. They shall be accurate within 0.4 percent under operating conditions. All exposed fulcrums, clevises, and similar working parts of scales shall be kept clean and properly maintained.

- The quantities by weight of repair material components and aggregates in each batch of material, as indicated by the scales, shall be within the following percentage of the required batch weights:

    - Aggregates ± 2 percent

    - Other components ± 1 percent

- Measuring tanks for mixing water or liquid shall be of adequate capacity to furnish the maximum amount of mixing water or liquid required per approved batch. Measuring tanks shall provide the means for readily and accurately measuring the amount of water or liquid required. Accuracy of water measurement shall be plus or minus 1 percent.

9. Forms

Forming material shall be wood, plywood, steel, or other approved material and shall be mortar tight. The forms and associated falsework shall be substantial and unyielding and shall be constructed so that the finished repair conforms to the specified dimensions and contours. Form surfaces shall be smooth and free from holes, dents, sags, or other irregularities.

Before the forms are set into place, the surface of the form shall be lined with plastic sheeting or coated with a non-staining form release agent compatible with the repair material being used. This prevents bonding of the repair material to the forms. If the forms are lined with plastic, the plastic shall be stretched taut to remove all wrinkles and folds and maintain a smooth condition during the placement and curing of the repair material.

Metal ties or anchorage within the forms shall be equipped with cones, she-bolts, or other devices that permit their removal to a minimum depth of 25mm without injury to the concrete or repair material. Ties designed to break off below the surface of the concrete shall not be used without cones.

All visible edges and corners included in the repair location shall be shaped the same as adjacent or similar edges or corners of the structure being repaired.

Forms shall be constructed to facilitate consolidation and complete filling of the repair void, and, when all surfaces are formed, to facilitate applying pressure to the repair material immediately after placement.

10. Mixing, conveying, and placing

Proprietary repair material shall be mixed and conveyed to the forms according to manufacturer's written recommendations. Material that cannot be placed within the manufacturer's time requirements shall not be placed in the forms and shall be discarded offsite at locations selected by the contractor.

Concrete repair material shall not be placed until the subgrade, forms, and steel reinforcement have been inspected and approved by the engineer.

The contractor shall have all equipment and material required for curing available at the site ready for use before placement of repair material begins.

No concrete repair material shall be placed except in the presence of the engineer. The contractor shall give reasonable notice to the engineer each time concrete repair material is scheduled for placement. Such notice shall be adequate to allow the engineer sufficient time to review and approve the subgrade, forms, steel reinforcement, and other preparations for compliance with the specifications. Other preparations include, but are not limited to, the mixing and delivery equipment and system, placing and finishing equipment and system, schedule of work, work- force, and heating and cooling facilities as applicable. All deficiencies are to be corrected before concrete repair material is mixed for placement.

The concrete repair material shall be deposited as closely as possible to its final position in the forms and shall be worked into the corners and angles of the forms and around all reinforcement and embedded items in a manner to prevent segregation of aggregates or excessive laitance. The depositing of repair material shall be regulated so that the material can be consolidated with a minimum of lateral movement.

Unless otherwise approved, concrete repair material shall not be dropped from a height greater than recommended by the manufacturer or 5 feet, whichever is less.

Unless otherwise specified, all concrete repair material required for each repair location shall be placed in one continuous operation. Successive layers or batches shall be placed at a rate sufficient to prevent setting of material between successive layers.

At the time of placement of repair material, the existing concrete surface shall be damp and without free water unless otherwise specified or required by the manufacturer of the proprietary repair material being used.

11. Consolidating

Concrete repair material shall be consolidated to ensure positive contact of repair material with all repair surfaces and reinforcing steel, to remove entrapped air pockets and voids, and to maximize the density of the repair material.

Vibration shall not be applied directly to the reinforcing steel or other embedded items, the forms, or to concrete repair material that has hardened to the degree that it is no longer plastic. The use of vibrators to transport concrete repair material in the forms or conveying equipment is not allowed.

Proprietary repair material shall be consolidated in accordance with the manufacturer's recommendations.

Unless otherwise specified, conventional concrete mix repair material shall be consolidated in the following manner:

a. Conventional concrete mix repair material shall be consolidated with internal type mechanical vibrators capable of transmitting vibration to the concrete at frequencies not less than 8,000 impulses per minute. Vibration shall be supplemented by spading, rodding, or hand tamping as necessary to ensure smooth and dense concrete along form surfaces, in corners, and around embedded items.

b. The location, manner, and duration of the application of the vibrators shall be such as to secure maximum consolidation of the concrete repair material without causing segregation of the mortar and coarse aggregate and without causing water or cement paste to flush to the surface. Vibration shall compact the concrete repair material and bring it into intimate contact with the forms and embedded items while removing voids and pockets of entrapped air.

c. The contractor shall provide sufficient vibrators to properly consolidate the concrete repair material immediately after it is placed. Vibration shall be applied to the freshly deposited concrete repair material by slowly inserting and removing the vibrator at points uniformly spaced and not farther apart than twice the radius of action (i.e., the distance that the concrete repair material is visibly effected by the vibration). The area visibly effected by the vibrator shall overlap the adjacent, just vibrated area. The vibrator shall extend vertically into the previously placed layer of fresh concrete repair material at all points. This ensures an effective bond between layers. In thin slabs the vibrator(s) should be sloped toward the horizontal to allow operations in a fully embedded position.

d. The internal vibration of thin slabs (less than 220mm) may be augmented using surface vibrators when approved by the engineer. Consolidation of the concrete repair material from the top surface down, along with a leveling effect to assist the finishing operation, may be provided by vibrating screeds, plate or grid vibratory tampers, or vibrating roller screeds. The contractor's plan, including equipment selection and specifications, shall be submitted to the contracting officer for approval at least 5 days before concrete repair material placement using surface vibrating methods.

12. Patching Of Holes in Concrete

Holes: For the purposes of this section, holes are defined as penetrations completely through a concrete member, with interior surfaces approximately perpendicular to the surface of the existing member. Chip interior surface areas which are inclined and do not meet this criterion as necessary to meet this requirement.

Perimeter of holes at the surface shall form a regular shape composed of curved or straight line segments. Provide at least the minimum placement depth specified for the material used at all locations. Score existing concrete by saw cutting and chip as needed to meet this requirement.

Roughen the interior surface of holes less than 300mm in diameter to at least 3mm amplitude. Roughen larger holes to at least 6mm amplitude.

At holes not filled with repair mortar or non-shrink grout, and where otherwise recommended by the repair material manufacturer, coat existing surfaces to be repaired with epoxy bonding agent.

Where a surface of a member is exposed to view and the repair material cannot be adjusted to match the color of the existing concrete, hold back the repair material 50mm from the surface. Fill the remaining 50mm with color-adjusted cement grout. Roughen the surface of the repair material when placed to improve bond with the cement grout.

a. Patching Small Holes:

Fill holes less than 300mm in least dimension and extending completely through concrete members with repair mortar or non-shrink grout.

Fill holes in members normally in contact with water or soil with Class I non- shrink grout in accordance with CRD-C621 and ASTM C1107 Grade C and B (as modified below) when tested using the amount of water needed to achieve the following properties:

a. Fluid consistency (20 to 30 seconds) per CRD-C611 at initial testing.
b. Fluid consistency (45 seconds) per CRD-C611 at 30 minutes after mixing.
c. At temperatures of 7, 23, and 35^{0}C

b. Patching Large Holes:

Fill holes larger than 300mm in least dimension with repair concrete, repair mortar or non-shrink grout.

Provide large holes normally in contact with water or soil and not filled with Class I non-shrink grout with resilient waterstop placed in a groove approximately 6mm deep ground into the interior edge of the hole at the center of the wall providing a smooth surface in which to place the resilient waterstop. Alternatively, bond bentonite waterstop to the surface using an epoxy grout which completely fills all voids and irregularities beneath the waterstop material. Install waterstop in accordance with Section 03250 -Joints in Concrete Structures.

Provide reinforcing steel in layers matching existing reinforcement locations, except provide concrete cover required by the Contract Documents for the applicable service condition.
For holes smaller than 1200mm, reinforcement shall be at least #5 bars on 300mm centers in each layer required. At all holes larger than 700mm, drill and grout the reinforcement into the existing concrete.

c. Patching Of Lined Holes

These provisions apply to openings which have embedded material over all or a portion of the inside edge. Requirements for repairing holes in concrete specified above shall apply as modified herein. The Owner's Representative will determine when the embedded material is allowed to remain.

Where embedded material is allowed to remain, trim it back a minimum of 25mm from the concrete surface. Roughen or abrade the embedded material to promote good bonding to the repair material. Completely remove any substance that interferes with good bonding.

Completely remove embedded items not securely and permanently anchored in the concrete.

Completely remove embedded items larger than 25mm in least dimension unless composed of a metal to which reinforcing steel can be welded. Where reinforcement is required, weld it to the embedded metal.

Following additional requirements apply to concrete in contact with water or soil.

a. Fill lined openings less than 100mm in least dimension with epoxy grout.

b. Coat lined openings greater than 100mm but less than 300mm in least dimension with an epoxy-bonding agent prior to filling with Class I non-shrink grout.

c. Coat lined openings greater than 300mm in least dimension with an epoxy bonding agent and bond bentonite waterstop to the interior of the opening prior to filling with approved repair material.

d. Installation of Pipes and Frames

The following applies to installation of permanent pipes and frames in openings cut into existing concrete members.

Cut opening to a size which is a minimum of 25mm and a maximum of 75mm larger than the outside edge of the embedded item. At openings with sharp corners, take care not to saw cut beyond the opening so as to damage existing reinforcing bars. At openings which are greater than 600mm in least dimension, chip a keyway into the center of the wall. Keyway shall be at least 40mm in depth and from 95mm the member thickness in width. All surfaces except at the keyway shall be perpendicular to the member surface as specified herein for patching holes.

Provide embedded items with a flange or other positive means of anchorage to repaired members. At members in contact with soil or water, provide continuous waterstop flanges around embeds. Where concrete pipe will be embedded, provide resilient waterstop around pipe at wall centerline.

Roughen the interior surface of openings to at least 6mm-amplitude. Sandblast the embed surface to be in contact with concrete clean to promote good bonding to the repair material.

Fill the space between the frame and the existing concrete with Class I non-shrink grout.

Where surface of a member is exposed to view and the repair material cannot be adjusted to match the color of the existing material, hold back the repair material 50mm from the surface. Fill the remaining 50mm with color-adjusted cement grout

e. Non-Fixed Installation of Pipes

The following applies to installation through existing concrete of piping to be sealed with adjustable linked seals, resilient connectors, or packing and sealant. When more appropriate, the Employer's representative may require installation of a sleeve instead of the core-drilled hole specified herein.

Size core-drilled opening to permit installation of the required seal; locate to minimize cutting of existing reinforcing steel.

Where linked or resilient seals are to be installed, coat the interior surface of the opening with epoxy at least 3mm thick for a smooth and even surface promoting a good seal.

Where packing and sealant are required, seal exposed reinforcing bars with at least 3mm thick layer of epoxy extending 12mm beyond the bars on all sides. Prepare the surface of the cut concrete and the pipe as recommended by the sealant manufacturer.

f. General Crack Repair

To repair cracks identified by the Employer's representative as to be caused by shrinkage or thermal movement to be repaired by injection with chemical grout as specified herein.

To repair cracks not caused by shrinkage or thermal movement to be repaired by epoxy injection or as otherwise directed by the Employer's Representative.

g. Chemical Grout Crack Repair

Inject chemical grout into all cracks as directed by the Engineer in those structures included in the scope of work listed herein in accordance with the chemical grout manufacturer's installation instructions and recommendations.

Location of Injection Ports: Locate injection ports as recommended by the chemical grout manufacturer and as needed to insure complete penetration of the joint or crack with the grout. Spacing of injection ports shall not exceed 600mm

Drilling Ports: Drill holes for injection ports to the depth needed for proper distribution of the chemical grout. Take care to not damage any reinforcing steel.

Port preparation: Clean holes for injection ports of all debris and fit with an injection fitting as provided by the manufacturer of the chemical grout, or equal. Install injection fittings in accordance with manufacturer's instructions; allow fittings to remain in place until chemical grout injection work is complete in that area. Install caps or valves at injection ports to prevent back flow of uncured chemical grout after it has been injected.

Chemical Grout Injection:

1. Follow instructions and recommendations of the chemical grout manufacturer and its representatives for chemical grout mixing and injection procedures.

2. Seal cracks at the surface where needed to assure complete penetration of injected chemical grout and prevent loss of material.

3. Prior to chemical grout injection, inject water into ports to provide water for the reaction process, flush out foreign matter and verify continuity between adjacent ports. Inject water into each port until it begins to flow from an adjacent or nearby port.

4. If the water injection procedure indicates the potential presence of voids within members or behind members resting against soil, notify the Owner's Representative immediately.

5. Beginning at the lowest injection port, inject chemical grout until the grout begins to flow from an adjacent or nearby port. Repeat the process until the crack is completely filled. In general, port-to-port travel of the injection process will be from low to high in a continuous operation.

6. If port-to-port continuity does not occur at locations where continuity was verified through water injection, mark location and notify the Engineer.

7. Avoid sudden application of high pressure during the injection process.

8. After completion of the grouting operation, remove all ports and surface sealing materials leaving an undamaged surface

h.Epoxy Crack Repair

Inject epoxy into all cracks in damaged concrete as indicated by the Owner's Representative in structures included in the scope of work listed herein. Follow installation instructions and recommendations of the epoxy manufacturer.

Inject cracks with sufficient pressure to ensure full penetration of epoxy but without causing further damage.

Location, drilling and preparation of ports for injection: As specified for chemical grout herein.

Epoxy Injection:

1. Follow instructions of the epoxy manufacturer and its representatives for all mixing and injection procedures.

2. Seal all cracks at the surface where needed to provide for complete penetration of the injected epoxy and to prevent loss of material.

3. Beginning at the lowest injection port, inject the epoxy until it begins to flow from an adjacent or nearby port. Repeat the process until the crack is completely filled.

4. If port-to-port continuity does not occur, mark the location and notify the Owner's Representative.

5. Avoid sudden application of high pressure during the injection process.

6. After completion of injection operations, remove all ports and surface sealing materials to leave an undamaged surface.

i. Repair of Deteriorated Concrete

These provisions pertain to concrete damaged by abrasion, chemical attack or corrosion of reinforcing steel. The only material acceptable for surface repair is repair mortar as specified herein. Where the repaired surface is to be subsequently covered with a PVC liner or other protective material, coordinate finishing details with the liner material manufacturer.
Surface Preparation:

1. Remove loose, broken, softened and acid-contaminated concrete to sound, uncontaminated concrete.

2. Notify the Engineer when removal of deteriorated concrete is complete. Schedule two weeks for the Engineer to inspect the surface, perform testing for acid contamination, determine if additional concrete must be removed, and to develop any special repair details that may be needed. Should it be determined that additional concrete must be removed to reach sound, uncontaminated material, schedule another two-week period for further evaluation after completion of the additional removal.

3. Follow repair mortar manufacturer's instructions for additional surface preparation.

j. Repair Mortar Placement

Follow manufacturer's recommendations for mixing and placement of repair mortar. After the initial mixing of the repair mortar, do not add additional water to change the consistency should the mix begin to stiffen.

Place repair mortar to the minimum thickness recommended by manufacturer but not less than 25mm. Should there be areas where less than the minimum repair mortar depth of concrete is removed, Contractor may remove additional concrete to attain the minimum repair mortar thickness or may place repair mortar so as to increase the original thickness of the member. In any case, add repair mortar so that minimum cover over existing reinforcing steel is 25mm. Do not place repair mortar so as to create locally raised areas. Where there is a transition with wall surfaces which are not in need of repair, do not feather the repair mortar at the transition. Saw cut a score line to not less than the minimum repair mortar depth and chip concrete out to it to form the transition. Take care not to cut or otherwise damage reinforcing steel.

Finish repair mortar in an even, uniform plane to restore the member to its original surface. Out-of-plane tolerance: No localized depressions or projections; 6mm maximum gap between repair mortar surface and a 3000mm straight edge in any orientation at any location

13. Removal of forms

Unless otherwise approved, forms shall not be removed sooner than the minimum time recommended by the manufacturer of the repair material or 48 hours, whichever is greater.

Forms shall be removed only when the engineer is present. Forms shall be removed in a manner to prevent damage to the concrete repair material. Supports shall be removed in a manner that permits the repair material to take the stresses caused by its own weight, uniformly and gradually.

14. Finishing formed surfaces

All repaired surfaces shall be true and even, and shall be free of open or rough spaces, depressions, or projections. Immediately after the removal of forms:
All bulges, fins, form marks, or other irregularities that in the judgment of the engineer will adversely affect the appearance or function of the structure shall be removed. All form bolts and ties shall be removed to a minimum depth of 25 mm below the surface of the repair.

The cavities produced by form ties and all other holes of similar size and depth shall be thoroughly cleaned. After the interior surface has been kept continuously wet for at least 3 hours, the cavities shall be carefully repaired with a compatible patching mortar or packed with a dry patching mortar mixed not richer than one part cement and three parts sand.

Dry patching mortar shall be mixed in advance and allowed to stand without addition of water until it has reached the stiffest consistency that will permit placing. Manipulation of the mortar with a trowel during this period shall be performed as required to ensure the proper consistency.

Holes resulting from form bolts or straps that pass through the wall shall be entirely filled with mortar to form a dense, well-bonded unit. The mortar shall be tamped into place with a rod slightly smaller than the hole being filled. The hardened mortar shall be sound and free from shrinkage cracks.
All repaired areas shall be cured as specified in section 16 below.

15. Finishing unformed surfaces

All exposed surfaces of the concrete repair material shall be accurately screeded to grade and finished to match adjacent surfaces, unless otherwise specified. Water shall not be sprinkled or in any manner added to the surface of conventional concrete mix repair material during finishing operations.

Proprietary repair material shall be finished in accordance with the manufacturer's recommendations.

Joints and edges on unformed surfaces shall be shaped the same as adjacent or similar edges or corners of the structure being repaired.

Apply a smooth magnesium float finish to repair mortar.

When completed: No sharp edges. Exterior corners, such as at penetrations: 25mm radius. Interior corners: Square, except 50mm repair mortar fillet at corners to receive PVC lining

16. Curing

The repair material shall be protected against premature surface drying, rainfall, and freezing for at least 72 hours. For proprietary repair material, the manufacturer's recommendations for curing shall be followed. Replacement concrete repair material shall be protected from drying and freezing for 7 days after placement.

If curing compound is used, it shall be non-solvent type and shall conform to ASTM C309, Type 1-D, Class B, non-pigmented with a fugitive dye, unless otherwise specified. Curing compounds shall not be used if specifically prohibited by the proprietary repair material user guides .i.e. if manufacturer recommends use of a curing compound, use no material that would interfere with the bond of any coating or adhesive required to be applied to the surface.

On Cure repair mortar and non-shrink grout according to manufacturer's recommendations, except that minimum cure period shall be 3 days.

Cure other materials in accordance with Manufacturer’s recommendations,

17. Removal or repair

When the repaired area is honeycombed, damaged, or otherwise defective, the contractor shall remove and replace the defective repair. The engineer determines the required extent of removal, replacement, and/or repair. Removal and repair activities shall be performed only when the engineer is present.

SECTION 4 PIPELINES, PIPEWORK

Section 4A. Materials

1. General

1.1 Equivalency of Goods, Materials and Plant

Wherever reference is made in the Contract, including Specifications, Drawings and Bill of Quantities, to specified manufacturers or suppliers for the supply of goods, materials and plant for the Works, goods, materials and plant from no alternative manufacturers and suppliers will be permitted, unless otherwise expressly stated in the Contract, providing these other goods, materials and plant are substantially equal or of a higher quality than those of the specified manufacturer or supplier and are approved in writing by the Engineer. Differences between the specified goods, materials or plant and the proposed alternative shall be described in writing by the Contractor and submitted to the Engineer, together with such manufacturer's or supplier's technical literature and samples as the Engineer may reasonably require. At least 28 days prior to the date when the Contractor desires the Engineer's consent. In the event the Engineer determines that such proposed alternative goods, materials or plant do not ensure substantially equal or higher quality, the Contractor shall obtain the goods, materials or plant from the manufacturer of supplier specified in the Contract.

1.2 Materials

Any material which will come into contact with potable water or water to be used for potable supply shall comply with the UK regulations on the use of materials for potable water supply. Water Supply (Water Quality) Regulations 1989 and 15th Statement of the Department of Environment Committee on Chemical and Materials of Construction for use in public water supplies and swimming pools, published by the Department of the Environment, UK or national standards adopted for use in Kenya.

1.3 Approval

As soon as possible after commencement of the Contract, the Contractor shall submit to the Engineer for his approval a list of his proposed suppliers, sources of materials and proposed standards. No materials, plant or equipment shall be procured for the Contract without first obtaining the Engineer's approval. Samples of materials shall be submitted to the Engineer for approval as required by the Engineer. Materials subsequently supplied shall conform to the quality of the samples which have been approved by the Engineer. No standards, method of manufacture or specification shall be changed without the approval of the Engineer. Where possible, plant shall be supplied to the same standards or to compatible standards.

The Contractor shall provide secure storage for all samples submitted to the Engineer.

1.4 Dimensions

Plant and materials shall be supplied to the general arrangements and dimension, or to suit the dimensions, shown on the Drawings or otherwise indicated in the Contract. Where no such dimensions are shown the Contractor shall be responsible for sizing the Plant. Any redesign, extra design, additional construction or any other costs resulting from the use of Plant to other arrangements or to other dimensions shall be the responsibility of the Contractor.

1.5 Packaging and Protections

All items shall be adequately crated or packaged to withstand damage and prevent deterioration due to shipping, handling and storage. The methods of protection and shipping shall be to the approval of the Engineer.

1.6 Marking

All Plant shall be marked in accordance with Clause 5 of BS EN 545 and Clause 37 of BS 5163. Before shipping, all items shall be clearly marked. Crates or packages shall be marked on two sides with indelible paint with the name of the project, the Employer and the Contract number shall bear marks indicating the contents.

1.7 Receipt, Storage, Handling and Transportation

Plant, equipment and materials shall be stored in such a manner as to preserve its quality and condition to the standards required by the Contract. The Engineer shall refuse to accept or shall reject any materials of Plant that in his opinion is defective or otherwise fails to comply with the standards required by the Contract. All such defective items shall be removed from the Site as directed by the Engineer. Repairs shall be carried out in accordance with procedures approved by the Engineer and shall be completed to the Engineer's satisfaction.

1.8 Manufacturer's Certificates

The Contractor shall furnish the Engineer with a manufacturer's certificate conforming compliance to the specification in respect of all items of Plant, equipment and materials. The original and one copy of the manufacturer's certificate shall be delivered to the Engineer not later than 14 days prior to the intended date of delivery of the item to Site.

1.9 Proprietary Materials

Proprietary materials shall be supplied in suitable containers and in appropriate batch sizes for the work to be undertaken. The containers shall be marked with the following information:

i. Storage instructions
ii. The manufacturer's name
iii. Shelf life and dates of manufacture
iv. Material identification
v. Batch reference number
vi. Net weight
vii. Mixing instructions
viii. Any warnings or precautions concerning the contents and their safe use.

The Contractor shall supply with each consignment of proprietary material delivered to the Site, certificates furnished by the manufacturer or his agent stating:

i. The manufacturer's name and address
ii. The agent's name and address where applicable
iii. Material identification
iv. Batch reference numbers, size of each batch and the number of containers in the consignment
v. Date of manufacture.

1.10 Rejected Materials

Should any item of plant, materials or manufactured articles be in the judgment of the Engineer, unsound or of inferior quality or in any way unsuited for the purpose in which it is proposed to employ them, such items, materials or manufactured articles shall not be used upon the Works but shall be branded, if in the opinion of the Engineer this is necessary, and shall forthwith be removed from the Site.

2. Samples and Storage of Materials

Where required by the Engineer the Contractor shall submit to the Engineer for approval samples of pipes, fittings and materials prior to procurement. The Contractor shall only store pipe, fittings and other material at places approved by the Engineer and shall at all times provide adequate supervision and watchmen to prevent theft or damage. Any loss or damage incurred will be the Contractor's responsibility.
Pipes shall not be stacked higher than recommended by the manufacturer. The area on which the pipes are to be stacked shall be free draining, the grass or other vegetation shall be kept cut and suitable timber cradles shall be provided on which the pipes shall be laid. End stops to all stacks shall be provided.

Fittings and valves shall not be stacked more than one tier high and they shall be supported off the ground by suitable timbers.
Air valves, rubber joint rings, gaskets, bolts and similar fittings and materials shall be kept in approved locked premises and such fittings and materials shall not be distributed to the trench side until immediately prior to laying, fitting, jointing or assemble thereof. All rubber joint rings and gaskets must be stored in a cool damp location and all fittings and materials shall at all times be stored in the shade under cover and protected from the weather to the satisfaction of the Engineer.

3. Flanges

Flanges shall be faced and drilled to conform to the dimensions specified in BS 4504. Flanges shall be compatible with the pressure rating of the adjacent pipe work or as stated on the drawings. Bolts, nuts and washers (two washers per bolt) shall be to BS EN 1092-3; 2003. No bolt shall project less than two full threads beyond its nut after tightening. In no circumstances shall the shortening of excessively long bolts by cutting be allowed.
Gaskets shall comply with replaced by BS EN 1514 (1997) and replaced by BS EN 681-2 (200) and BS 681-1 (1996) Type W. Flanges shall be painted with two coats of epoxy resin paint. Puddle flanges shall be fitted to all pipe work passing through water-retaining structures and manholes greater than 2.5m deep.

4. Mechanical Couplings

Unless otherwise specified or shown in the Drawings pipes and fittings shall be supplied with flexible joints. Mechanical couplings shall be of the Dresser, Viking Johnson type without a centre register. Joints rings used shall be of the ethylene propylene rubber (EPDM) or other material approved by the Engineer. All mechanical couplings and flange adapters including nuts, bolts and washers shall be supplied with 'Rilsan' nylon thermoplastic polyamide applied by fluidized bed dipping or similar approved.

5. Materials for the Assembly of Flexible Joints

Lubricant shall be of a kind not conducive to the growth of bacteria and shall have no deleterious effects on either the joint rings or pipes. Lubricants for water supply shall not impart to water, taste, colour, or any effect known to be injurious to health.

6. Ductile Iron Pipes

6.1 General

Ductile iron pipes and fittings for water supply shall comply with BS EN 545 (1995). Pipes and fittings shall have spigot and socket joints unless otherwise specified. Pipes shall be class

K9. Spigot and socket flexible joints shall be of the push-fit type with gaskets of ethylene propylene rubber (EPDM). The Contractor shall supply 5% of the straight pipes suitable for cutting on site and these shall be clearly marked.

6.2 Corrosion Protection

Pipes and fittings shall be protected externally with an extruded polyethylene or polyurethane coating complying with DIN 30674 Part 1. Pipes and fittings shall be lined internally with centrifugally applied cement mortar and complying with DIN 30674. Joint areas shall be coated with epoxy or polyurethane to DIN 30674. All lining and coating materials shall be approved for contact with potable water by an internationally recognized body like the Drinking Water Inspectorate of UK.

7. Galvanised Steel Pipes

Galvanized steel pipes shall be medium duty manufactured to BS 1387.

8. Steel Pipes

8.1 General

Steel pipes shall be manufactured to BS EN 10224 or AWWA C200_and shall be suitable for the pressure ratings required by the Contract. Fittings shall conform dimensionally to BS EN 10224, AWWA 208-59 or AWWA M11. Unless otherwise specified or necessary to meet the requirements of the Contract steel pipes shall be manufactured as follows:

a) DN300mm and below shall be manufactured to minimum of Grade L235 or API 5L Grade B
b) DN350mm and above shall be manufactured to a minimum of Grade L275 or API 5L Grade X42.

The pipes and fittings of diameter 600mm or less shall be supplied with push-fit spigot and socket type joints with integral gasket of EPDM rubber or similar to BS EN 10224 or BS CP 2010. Pipes greater than 600mm shall be supplied with ends cut square suitable for use with flexible couplings and_the external weld ground back sufficiently.

The Contractor shall supply 5% of the straight pipes as half-length pipes (not exceeding 6m). Each pipe shall be supplied complete with a coupling for jointing.

8.2 Corrosion Protection

Steel pipes and fittings shall be protected externally at the manufacturer's works with fusion bonded epoxy resin in accordance with AWWA C213. Pipes greater than 600mm and all fittings shall also be lined internally with fusion bonded epoxy to AWWA C213. Pipes 600mm or less shall be lined with cement mortar to AWWA C205 or BS EN 10298. All lining and coating materials shall be approved for contact with potable water by an internationally recognized body like the Drinking Water Inspectorate of UK.

Where required by the Bills of Quantities, the Supplier shall also price for the provision of an alternative 3LPE coating to DIN 30670 or AWWA C215 of a triple wrap system of fusion bonded or sprayed epoxy primer, an intermediate polymer adhesive layer and an extruded high density polyethylene coating in general conformance with ISO/DIS 21809-1 Class B as appropriate.

9. Glass Reinforced Plastic (GRP) Pipes and Fittings

Glass reinforced plastic (GRP) pipes and fittings for sewers shall be high stiffness and shall comply with the relevant provision of BS 5480. The minimum pipe stiffness shall be 5,000 N/m2.

Pipes and fittings shall be marked in accordance with Clause II g. BS 5480.

Pipes shall only be cut by techniques which can be shown not to impair the pipes pressure regression performance. Where any pipe is cut the exposed fibres at the cut pipe end shall be resealed to prevent potential long term degradation. Methods of cutting and resealing exposed fibres shall be submitted to the Engineer for Approval. Elastomeric sealing rings and foils shall comply with BS EN 681.

On delivery to site and immediately prior to installation each pipe shall be visually inspected both externally, and where possible, internally for damage such as star cracking of the gel coat layer. Where any damage extends through the pipe wall the pipe shall be rejected or the damaged section cut out and replaced in accordance with repair methods approved by the Engineer. If in the Engineer's opinion the pipe is not suitable of repair it shall be rejected and removed from site.

10. uPVC Sewers and Pressure Pipes and Fittings

Unplasticised PVC pipes and fittings for water supply pressure pipes shall comply with British Standards 3505 current but also superseded by BS EN 1452 and 4346. They shall be obtained from an approved manufacturer and shall be minimum pressure rated (14 bars) unless otherwise stated.

Unplasticised PVC pipes and fittings for gravity sewers and drains shall comply with British Standards 4660 or 5481 and shall be obtained from an approved manufacturer. Restrained rubber ring type push fit flexible joints shall be used unless otherwise stated. Solvent weld joints will not normally be permitted. Pipes and fittings shall be protected from the direct rays of the sun at all times by means of reflective cover sheets.

11. Concrete Pipes, Bends and Junctions

Concrete pipes, bends and junctions for use in sewers shall be made with Sulphate-resisting cement. Pipes, bends and junctions shall conform to the requirements of BS 5911 for the particular class of pipe required to be used. The internal dimensions shall be true and regular and the internal surface smooth and free from surface blemish. The actual diameter of the pipe shall be not less than the nominal diameter. All joints shall be of the gasket type with flexible spigot and socket approved by the Engineer. Gaskets shall be Elastomeric complying with BS EN 681.

The main pipe and branches of all junctions shall be of the same strength classification and shall have the same internal dimensions as the pipes with which they are to be used.
The pipes, bends and junctions delivered to the Site shall be certified by the pipe manufacturer to have complied with BS 5911, or other approved standard and one copy of the certificate shall be delivered to the Engineer before the goods are unloaded.
Unless otherwise specified pipes are required to be of Extra Strength; they may, unless otherwise specifically called for, be reinforced either with cast-in steel or by an external wrapping of Fibre glass and resin, applied by an approved manufacturer.

The Contractor shall provide all facilities for and shall carry out jointly with the Engineer (if so required) a full visual inspection of all pipes, bends and junctions for manufacturer's defects and other faults or damage. Before any pipe, bend or junction is laid it shall again be carefully examined and sounded with a wooden mallet. Any pipe found to be cracked or otherwise defective shall not be used on the Works.

Concrete pipes shall be internally coated with a 100 percent solids coal tar epoxy lining 70 percent minimum epoxy content. Coat thickness 300 micron minimum.

12. Polyethylene Pipes and Fittings

12.1 General

Polyethylene pipes up to nominal size 63mm for below ground use shall be coloured blue and comply with the relevant provisions of BS 6572. Polyethylene pipes shall be High Density Polyethylene (HDPE) ultra-violet protected, black with coloured blue strips running the entire length suitable for the working pressure indicated in the Bill of Quantities (BOQ) bars.
The pipes shall be clearly and indelibly marked in a repeated pattern spaced at one (1) meter to show the name of the manufacturer, diameter, pressure rating, Standard Dimension Ratio (SDR), material grade, date of manufacture, etc.

House connection pipe work downstream of the manifold shall be PE80; all other HDPE pipe work shall be PE100.

12.2 Joints

Unless otherwise specified or approved by the Engineer polyethylene pipes shall be butt fusion or electrofusion welded. Where the latter is used, the fittings involved are deemed to be included in the rate for pipe laying. Joints between polyethylene pipes supplied from different manufactures or not manufactured from the same grade of polymer shall only be jointed by electrofusion or by push fit mechanical couplings. Mechanical couplers and compression type fittings shall incorporate a serrated internal liner to support the pipe against compression loads exerted by the fitting and to prevent pullout under axial load.

Butt or socket fusion joint techniques shall only be applied between pipes supplied from single source and manufactured from the same grade of base polymer. Fusion welding of polyethylene pipes shall only be undertaken by skilled operatives using appropriate specialized tooling. Pipes to be jointed shall be free from contamination and care shall be used to protect fusion jointing operations from wind and against the effects of inclement weather. Mechanical jigs or other approved methods shall be used to ensure correct alignment of the pipe when making butt fusion joints. Details of fusion welding procedures including details of tools, operatives, materials and method statements shall be submitted to the Engineer for approval prior to any jointing.

Steel and iron pipe fittings shall comply with the relevant provision of BS EN 545 (1995) replaced by BS EN 10224 but also current.

13. Gate Valves

13.1 General

Valves for normal duty on water pipelines with pressure ratings up to PN25 shall be key operated cast iron flanged gate valves for waterworks purposes generally complying with the

requirements of BS 5163 (Type B). All Gate Valves shall be supplied with a 10 year manufacturer's warranty.

Cast iron gate valves for pressure ratings to PN14 shall be cast iron flanged valves complying with BS 5150 replaced by BS EN 1171 (both BS 5150 and BS 5151) or cast iron parallel slide valves complying with BS 5151.

Butterfly valves for pressure ratings of up to PN14 shall be double flanged wafer type butterfly valves complying with BS 5155.

Unless otherwise specified valves for use on steel pipes shall be flanged, where butt-weld ends are specified valves shall comply with BS EN 1984, or BS EN 13709.

A bypass with gate valve forming an integral part of the valve shall be provided to all high pressure lines.

13.2 Wedge Gate Valves for Manual Operation

Valves up to and including DN 300 shall be of the resilient seal type and valves larger than DN 300 shall have metal seals.
Spindles shall be of the non-rising type and screwed so as to close the valves when rotated in the clockwise direction. The direction of closing shall be clearly cast on the valve cap or hand wheel as appropriate. The valves shall be constructed of the following materials:

body	-	cast iron;
spindle	-	forged bronze or stainless steel;
metal faces and seal	-	gunmetal.

The valves shall be suitable for the unbalanced head as specified or indicated in the schedules.

Suitable gearing and anti-friction devices such as ball bearing thrust collars shall be provided as necessary to enable opening and closing by manual operation at the pressure stated, using an effort no greater than 26kg on the tee key or hand wheel supplied. Hand wheels shall not exceed 500mm diameter. A bypass with gate valve forming an integral part of the valve shall be provided where recommended by the valve manufacturer for the pressures specified.

Gearing on valves of DN 300 and less shall be enclosed in a sealed gearbox suitable for buried installation and operated with a tee key. Except where shown in the Drawings, all valves exceeding DN 300 shall be provided with bevel gearing and hand wheels. Valves to be used for washouts and isolating air valves shall have screwed seats.

Extension spindles shall be galvanized or stainless steel adequately supported with cast iron brackets, and of sufficient diameter to prevent any whiplash effect through twisting when being used to operate the valves. The spindles shall be capped for key operation. Valve caps shall be fitted with hexagonal set screws.

Valves shall be coated with an approved epoxy complying with DIN 30674. Keys for valve operation shall be of sufficient length so that the valves can be operated by a man standing, but shall not exceed 1.2m in length, and shall have a detachable cross bar.

14. Butterfly Valves

14.1 General

Butterfly valves shall conform to BS EN 593. All Butterfly Valves shall be supplied with a 10 year manufacturer's warranty.

14.2 Construction

Butterfly valves shall have a high grade cast iron body to BS EN 1561 designed to the specified working and test pressures. The pressure rating valve shall be cast in the valve body. The disc shall be of high grade cast iron to BS EN 1561 or nodular cast iron to BS 2789 to the defined working and test pressures. It shall have a convex shape designed to achieve low head loss characteristics. The valve shafts shall be of stainless steel operating in self-lubricating bushes in the body.

The valve seat shall be of gunmetal to BS 1400. The sealing ring shall be a renewable Ethylene Propylene Diene Monomer (EPDM) rubber attached to the disc edge by a sectional bronze retaining ring to form a resilient and durable seal.

The valves shall be fitted with hand wheel actuators not exceeding 500mm diameter incorporating gearing to allow opening and closing by manual operation at the pressure stated using an effort no greater than 36kg on the hand wheel supplied.
In all cases the gearing shall be designed to close the valve, from fully open to fully closed in a period of not less than ten minutes with this effort. Actuators shall be designed so as to close the valves when the hand wheel is turned in a clockwise direction; the direction of closing shall be clearly cast on the hand wheel. Position indicators shall be fitted to all actuators.
Where required valves shall be electrically actuated with a manual override. Remote actuation shall be provided with a visual indication of valve open, valve closed and percentage opening together with fault indication.

14.3 Valve Performance

A performance curve, relating percentage valve travel, open area and discharge coefficient shall be submitted to the Engineer. The head loss coefficient with valve fully open shall be defined.

14.4 Testing

All valves shall be tested in accordance with BS EN 593 and pressure and material test certificates shall be submitted to the Engineer for approval.

15. Non-Return Valves

16.1 Swing Check Valves

Non-return valves shall be suitable for waterworks purposes and shall be manufactured to comply with the general requirements of BS EN 12334. They shall be double flanged type, non-slamming and recoilless on flow reversal.

Valves of DN 700 and larger shall be of the multi-disc type or tilting disc type. The valves shall have a high grade cast iron body and cover to BS EN 1561 Grade 220/260 with gun metal nickel bronze alloy door seating. The hinge pin shall be of stainless steel carried on non-corrodible bearings.

16.2 Nozzle Check Valves

Nozzle check valves shall be slam free closing with a streamlined cross section as manufactured by Mannesmann Demag or similar.

16. Flow Control Valves

Flow controls unless otherwise specified shall be butterfly valves. They shall be installed complete with a headstock and position indicator showing the degree of opening.

17. Pressure Reducing Valves

Pressure reducing valves shall automatically reduce a higher inlet pressure to a steady lower downstream pressure regardless of changing flow rate or varying inlet pressure. The valve shall be a hydraulically operated pilot controlled diaphragm type, globe or angle valve. The Kv loss factor of the standard valve throttled to 5% opening should be less than 3% of the Kv factor of the fully open valve. This data should be backed by a hydraulic test report. All valve components shall be accessible and serviceable without removing the valve from the pipeline. Stainless steel nuts and bolts shall be used in assembly of the PRV for corrosion protection.

The critical cavitation coefficient of the PRV will be Less than 1.5. The minimal upstream opening pressure should be at least 5 m pressure. The minimal pressure differential for valve closure should be less than 2 m pressure.

The downstream pressure in steady-state conditions should have an accuracy of +0.5 m pressure (0.05 bars) of the set-value at high, as well as near-zero demand flow rates.

The valve should regulate to a steady, pre-set downstream pressure, regardless of flow or supply pressure variations. The gain of the valve in low travel should be so that the Kn/Kv < Tn/To (Kn is the Kv at travel Tn. To is the complete valve travel). The main valve shall have a single removable seat and a resilient disc.

18. Ball Float Valves

Ball float valves which are to be installed within reservoirs shall be the delayed action type to eliminate inflow at small valve openings. They shall be fitted with a stilling chamber, auxiliary float valve and inlet bellmouth with regulating valve. The main valve shall be fitted with a long actuating lever to provide a long float travel for slow valve closure.

Valves shall be of the right angle pattern type with flanged inlet and have a resilient synthetic rubber disc which forms a drop tight seal against a removable seat insert. Valves shall be free of cavitation and vibration under the specified working conditions. Flanged tapers shall be provided on the inlets as necessary to suit the size of valves proposed.
Valves shall be capable of withstanding the maximum static pressure and of passing the maximum flow rate shown. Orifice plates shall be provided as necessary to absorb excess working pressure at the initial flow rates indicated.

The pressure rating of the valve shall be cast into the body of the valve.

19. Constant Flow Valves

Constant flow valves shall maintain a constant rate of flow regardless of fluctuations in upstream pressure.

Valves shall be hydraulically operated, diaphragm actuated globe pattern. They shall have a resilient synthetic rubber disc which forms a drop tight seal against a removable seat insert. The diaphragm assembly and valve stem shall be fully guided at both ends by bearings in the valve cover and valve seat. The diaphragm shall consist of nylon fabric bonded with synthetic rubber. Packing glands and stuffing boxes are not permitted and there shall be no pistons operating the valve or pilot controls.

The pilot control shall be direct acting diaphragm valve designed to close when the actuating differential increases beyond the spring setting. The actuating differential pressure shall be produced by a thin edged orifice plate installed in an orifices flange downstream of the valve. Any necessary repairs to the valve shall be accomplished without removing the valve from the main.
Valves shall be sized to pass the maximum continuous flow stated on the drawings at the working pressure given. The pressure rating of the valve shall be cast into the body of the valve.

20. Surface Boxes and Chamber Covers

Surface boxes and chamber covers shall be either Reinforced Concrete or Polyresin.

Surface boxes over gate valves shall be hinged and chained and shall generally comply with BS 5834.
In roads, tracks, verges: Heavy duty with 150 x 150mm nominal clear opening.
In fields and areas subjected to light wheeled or pedestrian traffic: Medium duty with 150 x 150 mm nominal clear opening.

Surface boxes for hydrant chambers shall have a 150 x 150mm clear opening and shall comply with BS 750 and shall be suitable for heavy traffic loading.

Covers to air valve and other chambers shall be to the dimensions and loading requirements shown on the Drawings or as stated in the Bill of Quantities.

Covers shall be suitable for the following maximum safe centre static loads:

Light duty	-	250kg
Medium duty	-	1500kg
Heavy duty	-	5000kg

Where applicable, covers shall comply with BS EN 124 or other appropriate Standard.
Lifting keys shall be provided for each type surface box or cover supplies. One set of keys shall be provided for every ten surface boxes or covers subject to a minimum of ten sets of keys or the actual number of covers if less than ten.

21. Gully Gratings and Frames

Road gully gratings and frames shall be of approved type and manufacture in cast Grey Ductile Iron and shall be of Heavy Duty Non-rocking Pattern designed for wheel load of 11.5 tonne and generally in accordance with BS EN 124. Single gullies of nominal size 1050mm x 750mm. Inlet gratings of other plan dimensions shall have a minimum water way area of 49% of the total inlet grating area.

Gully frames shall be set in cement mortar and haunched with Class C25 concrete. It shall be the Contractor's responsibility to establish the finished road levels from the appropriate authority and fix the gratings accordingly.

22. Manhole Safety Chains

Mild steel chain shall be 8 mm nominal size Grade M (4) non-calibrated chain, Type 1, complying with BS withdrawn. After manufacture, mild steel safety chains shall be hot dip galvanized in accordance with BS EN 124.

23. Manhole and Chamber Access Covers

The manhole and chamber access covers shall comply with BS 497 Part 1 and be obtained from an approved manufacturer and shall be to the internal minimum clear opening as detailed in the Contract.
All manhole and chamber access covers in road shall be to an approved Heavy Duty pattern and in footpaths shall be medium/heavy duty unless otherwise specified. The frame and lid shall have key holes formed with sealed pockets underneath to prevent ingress of sand, grit and surface water and shall be of an approved non-rocking pattern. The covers and frames shall have accurate seating faces to prevent rocking and the ingress of sand or water, and it shall be tight fitting to resist overflow conditions or unauthorized removal. The seating faces shall be coated with graphite grease before installation of the cover.

A supply of keys for use with every type of manhole cover and surface box shall be handed over by the Contractor at the completion of the Contract on the basis of one set of keys for each 50 covers or part thereof.

Manhole and chamber cover frames shall be set in cement mortar and haunched with Class C30/10 concrete and shall be set to the camber or fall of the finished road surface. It shall be the Contractor's responsibility to establish the finished road surface levels from the appropriate authority and to fix the covers accordingly.

24. Manhole Step Irons

Manhole step irons shall be of galvanized malleable iron and shall conform in all particulars to BS EN 13101.

SECTION 4B. PIPELINE CONSTRUCTION

1. General

This section covers the installation of all types of gravity flow pipelines.
The pipelines shall be constructed in accordance with BSCP 2010

2. Pipes and Fittings

Pipes and fittings shall be of the type shown on the Drawings and shall comply with the following standards and requirements:

2.1 Concrete and Clayware and Fittings

Concrete and Clayware pipes and fittings shall comply with the appropriate standards listed below:-

BS65	Clay drain and sewer pipes and fittings
BS 1194	Concrete porous pipes for under drainage
BS 1196	Clayware field drain pipes
BS 5178	Prestressed concrete pipes for drainage and sewerage
BS 5911	Concrete cylindrical pipes and fittings

2.2 Steel, cast Iron and Ductile Iron Pipes and Fittings

Steal and ductile iron pipes and fittings shall comply with the following standards:

BS 437	Cast iron and socket pipes and fittings
BS 534	Steel pipes and specials for water and sewerage
BS 4772	Ductile iron pipes and fittings

Steel pipes which are to be welded shall have the ends prepared by the manufacturer to suit the type of welded joint to be used.

2.3 Unplasticised PVC and GRP Pipes and Fittings

Unplasticised PVC pipes shall comply with BS 4660 or BS 5481 as applicable for drain pipes. GRP pipes and fittings shall comply with BS 5480.

3. Topographic Surveys

Topographic surveys along pipeline routes shall be either:-

- Plan and profile surveys, or
- Line and level traverse surveys,

As instructed by the Engineer.

Plan and profile surveys shall cover a strip of 10.0m wide centrally on the proposed centre line of the pipeline. The survey shall be carried out in accordance with the specification detailed in Clause 106.

Line and level surveys shall comprise a traverse line along the centre line of the pipeline as established by the Engineer.

4. Handling and Transport of Pipes and Fittings

The loading, transporting, unloading and handling of pipes and fittings shall be carried out such that no damage is caused, all in accordance with the recommendations of the manufacturer and to the approval of the Engineer. The use of lifting hooks is not permitted. Pillows shall be provided between lashing (ropes, wires or chains) and the pipes. All cradles and lashings shall be of such widths as to prevent damage to the coating of the pipe, or distortion of the pipes.

Valves and fittings shall be transported in timber packing and where possible in the manufacturer's original packaging.
Protective cover and other protective materials provided by the manufacturer shall not be permanently removed until immediately prior to installation.

In the event of any damage being caused to a pipe, the Engineer shall determine whether damaged piece shall be replaced or repaired. Repair to coating only shall be allowed and shall be as directed by the Engineer.
In all instances when along trench sides, ferrous pipes shall be supported within 1 metre of either end on sand filled bags such that no part of the wall of the pipe touches the ground, and in the case of pipes over 6 metres long with additional central sand bags.
When pipes are being loaded into vehicles care shall be taken to avoid their coming into contact with any sharp corners such as cope irons, loose nail heads, etc. Whilst in transit, pipes shall be well secured over their entire length and not allowed to project unsecured over the tailboard of the lorry.
Pipes may not be offloaded from Lorries by rolling them, suitable carnage shall be used. Pipes shall not be rolled or dragged along the ground.

5. Stringing and Examination of Pipes Prior to Laying

All DI and Steel Pipes and their coatings and linings shall be carefully inspected on Site prior to laying.

Inspection of the pipe will be made by the Engineer after delivery and again immediately prior to laying. Any pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall immediately be removed from the site.

All pipe or fittings shall be examined before lying and no piece shall be installed which is found to be defective. Any damage to the pipe linings or coatings shall be repaired as directed by the Engineer. Handling and lying of pipe and fittings shall be in accordance with the Manufacturer's written instructions and as specified herein.
Before lowering into the trench or placing in position each ductile iron pipe or casting shall be slung and sounded with a mallet to test for hair cracks. Pipes that do not ring true will be discarded.
All cement mortar linings shall be visually inspected for defects such as cracking or spalling and crack widths shall be measured to confirm that width is such that natural re-sealing will occur once put into service; otherwise cracks as well as any spalling shall be made good before laying in accordance with the manufacturer's written instructions.

All epoxy linings and all coatings shall be subjected to holiday detection tests, in accordance with NACE RP 0490, the voltage of the holiday detector being selected appropriate for the material and its thickness. No pipe shall be laid having failed the holiday tests until the defective area is made good in accordance with the manufacturer's written instructions and retested satisfactorily before use.
All pipe and fittings shall be thoroughly cleaned before laying, and shall be kept clean until they are used in the work, and when laid, shall conform to the lines and grades required. Pipe shall not be laid unless the trench is free of water and in a satisfactory condition. Ductile iron pipe and fittings shall be installed in accordance with the requirements of AWWA C600 except as otherwise provided herein. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner by the Contractor, at his own expense.

When laying is not in progress, including any work break exceeding 30 minutes, the open ends of the pipe shall be closed by watertight plugs or other approved means. Good alignment shall be preserved in laying. The deflection at joints shall not exceed that recommended by the Manufacturer. End caps shall not be removed until such time as the pipe is to be inspected and laid.

Where the pipeline crosses roads, tracks or any other access or where directed by the Engineer, the Contractor shall place the pipes so that access to the public is not in any way prohibited.
Shortly before laying or fixing any valve, pipe or fitting, the Contractor shall examine each valve, pipe and fitting to ascertain that there is no damage or defect. The Contractor shall give the Engineer not less than 48 hours' notice of his intention to undertake such examination. The Contractor shall not lay such pipes and fittings until he has received approval from the Engineer.

Linings shall be inspected prior to laying and any defect made good.

6. Laying Pipes

Immediately before any pipe is lowered into the trench the plug shall be removed from the end of the last pipe laid and the new pipe shall be carefully lowered into the trench.
Each pipe and fitting shall be laid true to alignment curve and gradient in accordance with the Drawings or as directed by the Engineer. The minimum gradient shall not be flatter than 1 in 500.
Pipes shall be boned to gradient and sight rails shall be provided for this purpose at intervals not exceeding 50m and at all changes in grade. No dips or summits shall be permitted other than as shown on the Drawings.

7. Embedment and Compaction

All ductile iron and steel pipes shall be embedded using a sand or coarse grained soil with less than 12% fines, which if necessary shall be imported if excavated material is found to be unsuitable:

In areas prone to water logging or where specifically called for on the Drawings or in the Bills of Quantities a single size or graded gravel shall be used as a special lower bedding, with grading as indicated below.

Nominal Pipe Diameter (mm)	Grading for Special Lower Bedding [to ASTM Sieve Sizes]	
	Single size Gravel	**Graded gravels**
< 200	10 or 14 single-size gravel	14 to 5 graded
200 to 500	10, 14 or 20 single-size gravel	14 to 5 graded or 20 to 5 graded
> 500	10, 14, 20 single-size crushed rock, or gravel	14 to 5 graded or 20 to 5 graded

The suitability of as-dug trench material as an embedment material and where imported, the source shall be approved by the Engineer. Any delays as a result of not seeking this approval in good time shall be entirely to the Contractor's account
All layers of the embedment shall be thoroughly compacted, and shall not exceed 150 mm and be raised evenly on both sides of the pipe as it is placed. A minimum compaction of 90% MPD shall be achieved at all times, this being confirmed by sampling and testing at intervals on different levels of embedment at intervals of not more than 50 m with testing in accordance with BS 1377 or ISO 22476 using the "sand replacement" method.

Should any results fail to achieve this absolute minimum level, then the pipes, embedment material and layer shall be removed for an equal distance on either side of the failed test, the total distance being equal to the length between adjacent sampling locations, and re-laid appropriately but with compacted layer thickness halved. In addition the distance between sampling and testing shall also be halved until in the opinion of the Engineer's Representative a sufficient number of consecutive passes allows both individual layer thickness and the distance between sampling and testing to be returned to the previous thickness and spacing. All backfill soil above the embedment shall be free from clay lumps, boulders and rock fragments greater than 50 mm and as far as practicable, given the nature of the soil, 90 % MPD shall be attained. However, this requirement may be relaxed to 85% MPD by the Engineer's Representative if he considers the circumstance warrant it.

7.2 Pipes Laid in Trench

Pipes and fittings laid in trench shall have at least the minimum cover stated in the Drawings. Long radius curves in buried pipelines shall be negotiated by deflections taken up in the joints of one or more pipes. The deflection at joints shall not exceed 75% of the manufacturer's maximum specified limits. Designs have been based upon the use of 6m long pipes. If the Contractor provides longer pipes sufficient short lengths shall be provided to enable the proposed pipe curvature without additional bends or deep excavation.

Pipes shall not be dragged along the trench bottom. Pipes laid in trenches shall be laid and firmly bedded on an even and uniform bed. Where pipes are not laid on a granular bed, the bottom of the trench shall be smooth and free from stones or other projections.
Joint holes shall be excavated below the trench bottom and shall be as small as possible and shall be filled in and compacted after the pipes are laid and before the refilling of the trench is commenced.

7.3 Pipe Bedding and Surround

For polyethylene, uPVC and GRP pipelines, Class S bedding shall be used where the cover is equal to or greater than 1.0m. Where there is less than 0.6m cover, Class A concrete surround shall be used. In between the Engineer shall decide upon the bedding type dependent upon the assessed risk of damage to the pipe.

7.4 Pipes Laid Above Ground

Pipelines to be laid above ground shall be constructed of flanged ductile iron pipes with mechanical type expansion joints. Supports shall be provided at a maximum spacing of one pipe length and adjacent to the flanged joints.

The expansion joints shall compensate for a variation of ambient temperature between zero and 40° C on the adjoining pipeline. Anchorages shall be provided immediately uphill of each expansion joint and at each change in vertical and horizontal alignment. The ground/rock surface under the pipeline shall be re-graded as necessary to allow a satisfactory vertical alignment of the pipeline.

The Contractor may propose, as an alternative to the use of mechanical expansion joints, either of the following methods for accommodating thermal expansion:

(1) A zigzag pipeline alignment whereby the thermal movement is accommodated by deflection of the bends.
(2) A rigid form of construction with the thermal movement being constrained within the pipe walls by the use of substantial anchor blocks.

Joints shall be made in compliance with the manufacturer's instructions as approved by the Engineer. Care shall be taken to ensure the absolute cleanliness of the pipe ends and joint components. Only the recommended approved lubricants shall be used.
Jointing shall only be carried out by experienced personnel under close supervision by the Contractor.

The Contractor shall ensure that no dirty water or other extraneous matter is allowed to enter the pipes during or after lying. In the event of dirty water or extraneous matter entering the pipes the Contractor shall immediately carry out cleaning and disinfection as directed by the Engineer.

Except when necessary for jointing, the end of the last pipe laid shall be kept plugged to the satisfaction of the Engineer to prevent the ingress of dust, dirt, rocks and other debris.
The Contractor shall be liable for any damage caused to the Employer's Plant and apparatus or other equipment as a result of foreign matter of any kind not having been cleared out of pipelines before Taking-Over.
Pipe trenches shall not be backfilled until approved by the Engineer. Once approved trenches shall be backfilled without delay to at least the minimum extent required for pressure testing.

8. Cutting Pipes

The edges of the cut pipes shall be clean, true and square. Ductile iron pipes shall only be cut with an approved mechanical pipe cutter in conformity with the pipe manufacturer's recommendations. The use of oxyacetylene flame cutter will not be permitted. The edges of the cut together with those parts of the pipes from which the coating has been removed shall be given two coats of bituminous paint and the internal lining repaired. When the cut pipe is to be inserted in a "Tyton" type joint it shall be bevelled for 10mm at 30° to pipe the axis.
Asbestos Cement, HDPE, uPVC and GRP pipes shall be cut with an approved mechanical pipe cutter and in conformity with the pipe manufacturer's recommendations. Where the cut end of the pipe is to be incorporated in a joint the pipe shall be turned down to the correct diameter required for forming the joint by and approved mechanical turning machine. The length of

turning shall be accurately bevelled by mechanical means to the dimensions specified in the manufacturer's recommendations.

Steel pipes shall be cut by using a mechanical pipe cutter approved by the Engineer. The use of an oxyacetylene flame cutter will not be permitted. The edges of the cut shall be given two coatings of liquid epoxy compatible with the original coating. The external coating and the internal lining shall be repaired to the approval of the Engineer. The cut end shall be bevelled as required to suit the form of joint used. The cost of all cutting, trimming, chamfering, threading, etc, shall be included in the rates for laying and jointing the pipes.

9. Proprietary Joints and Couplings

Proprietary joints and couplings shall be assembled in accordance with the manufacturer's instruction as approved by the Engineer. Where pipes are laid above ground and jointed with bolted couplings the joint shall be protected against vandalism by sheathing with an approved heat-shrink moulding as manufactured by Raychem of Swindon UK or similar approved.

10. Flanged Joints

Flanged joints shall be made with two washers per bolt, one under the bolt head and the other under the nut. The tightening of the bolts shall be carried out in the sequence and to the torque recommended by the manufacturer. A torque wrench shall be used.
Buried flange joints shall be protected by painting with approved bitumen paint and by wrapping using 'Denso' paste, mastic tape and outer wrap, or similar approved materials all in accordance with the manufacturer's instructions as approved by the Engineer, unless supplied with epoxy coating and galvanized bolts.
Flanged adaptors and mechanical couplings shall have a RILSAN nylon coating applied by the manufacturer.

11. Steel Pipelines Welded Joints

If specifically required under the contract pipes shall not be welded. If permitted by the Engineer for particular conditions the Contractor shall submit to the Engineer a detailed method statement for constructing the pipeline using welded joints which shall include, but not be limited, to:

(i) details of the Contractor's skilled labour and supervision staff who have direct experience in the construction of welded steel pipe;
(ii) Details of the Contractor's plant to be deployed;
(iii) Details of temporary staging, access and craneage;
(iv) Procedure for construction of supports and anchorages, and welding joints;
(v) Quality assurance proposals for testing the integrity of the welds.

These details shall be submitted to the Engineer for his approval not later than 21 days before the Contractor wishes to commence pipe lying.

All field welds shall be inspected visually with special attention given to the line up and down the root run or stringer beads. Non-destructive testing of the completed weld shall be carried our using radiographic methods with procedures in accordance with BS 2910.

On completion and inspection of joint welding, remedial works shall be carried out on the internal lining and external coating. No more than five pipe joints shall be welded without completion of remedial works to joints.

12. Fixing Valves and Penstocks

Valves, penstocks and other fittings shall be securely fixed. Extension spindles and headstocks shall be properly aligned and fixed in a vertical position and valve caps shall be fixed securely using the locking nut.

13. Thrust and Anchor Blocks

Concrete thrust and anchor blocks shall be formed at bends tees and valves in accordance with the details shown on the Drawings or as directed by the Engineer. Excavation shall be made after pipe lying and the blocks concreted immediately after excavation. The back supports and blocks shall abut in to solid undisturbed ground with all loose material being removed before concreting.

No pressure shall be applied in any section of main until the concrete has achieved adequate strength and at least three day's curing.

Flexible joints shall not normally be cast in. Where the size of the block does not make this possible, additional flexible joints shall be provided no greater than half a pipe diameter beyond each face of the block.

14. Concrete Surround to Pipes

Where pipelines pass under streams and rivers or where directed by the Engineer, the pipeline shall be surrounded with concrete as shown on the Drawings.

Concrete surround shall be "broken" at all pipe joints to retain flexibility in the pipeline. No joints shall be concreted in without the prior approval of the Engineer.

15. Flotation of Pipelines

The Contractor shall ensure that flotation of the pipeline does not occur during construction. Sufficient backfill shall be placed over each pipe after laying and before testing to prevent flotation.

16. Pressure Rating

The pressure rating of pipes shall be as indicated on the drawing or Bill of Quantities or if not indicated then selected such that the maximum pressure in the pipeline inclusive of surge pressures shall not exceed the maximum allowable sustained working pressure rating of the pipe;

The surge pressure amplitude (the difference between maximum and minimum surge pressures) shall not exceed one half of the maximum allowable sustained working pressure rating of the pipe.

17. Testing of Water Supply Pipelines

All pressure pipelines shall be hydrostatically tested. Site test pressures shall be1.5 times the maximum working pressure or allowance pressure plus 5 bar whichever is the smaller measured at the lowest part of the pipeline, unless otherwise specified on the drawings.

The Contractor shall give the Engineer not less than 48 hours' notice of his intention to carry out a pressure test. Testing shall not commence without the Engineer's approval. Before a length of pipe is tested, each pipe shall be securely anchored. All thrust and anchor blocks shall have been constructed and, the barrel of each pipe shall be backfilled to the extent necessary to prevent flotation or movement of the pipeline and shall be not less than 600mm.

Normally joints shall be left exposed until pressure testing has been satisfactorily completed. Any need to backfill a pipeline before pressure testing shall not relieve the Contractor of his responsibility to excavate to locate and repair any leaks.

Pressure testing shall be carried out as the work proceeds in such lengths as are convenient but not exceeding 500m. The ends of the length of pipeline under test shall be closed by means of securely anchored caps or blank flanges. Pipeline valves shall not be used for this purpose. All washout valves shall be fitted with blank flanges and the valves opened before the commencement of any pressure test. At each air valve location, a special air release arrangement shall be provided to allow manual release of air during filling operations. Pressure testing shall not be carried out with permanent air valves in place. The pipeline to be tested shall be filled slowly with water in such a manner that all air is expelled. Air vents shall be checked to ensure that no air is trapped at high points.
The pressure in the pipeline shall slowly be raised to the working pressure, the test pump disconnected and the pipeline left charged under pressure with air valves opened for a period of not less than 24 hours to allow air in the pipeline to be expelled and pipe linings and pipe walls of absorbent materials to become saturated. At the end of this period of time air valves shall be closed and the test pump shall be reconnected and the pressure in the pipeline raised to the test pressure and this pressure maintained for a period of 24 hours or such other period as directed by the Engineer.

Throughout this period the pressure in the pipeline shall not be allowed to fall or rise more than 6m head of water above the test pressure and this shall be accomplished by pumping water into or releasing water from the pipeline as required. The volume of water pumped into or released from the pipelines shall be carefully measured. At the end of the test period the pressure in the pipeline shall be adjusted to the test pressure by pumping water into or releasing water from the pipeline as required.

The apparent leakage from the pipeline shall be ascertained from the net volume of water that has been pumped into the pipeline during the test period. The permissible loss shall not exceed 2 litres per metre nominal bore per kilometer length per m head per 24 hours.

During the pressure test exposed joints shall be inspected and any leakage or seeping joints shall be remedied. All signs of leakage shall be remedied whether total apparent leakage from the pipeline under test is less than the apparent allowable leakage or not. Should any length of pipeline fail to pass the pressure test the Contractor shall at his own expense carry out all work necessary to locate and remedy the faults and to retest the pipeline until it satisfactorily passes the test.
A low pressure air test (not exceeding 0.3 bars) may be used as a preliminary joint tightness test prior to backfilling and hydrostatic testing. The water used for pressure testing shall be provided by the contractor and shall be free from impurities and of such a quality which will not pollute or injure the pipeline. The Contractor shall be responsible for obtaining the water, transporting it and for its safe disposal on completion.

18. Cleansing and Sterilizing of Pipelines

After the pipelines have been completed and pressure tested satisfactorily as herein specified the Contractor shall flush out and cleanse the pipelines. Where water is provided by the Employer, the cost of this will be reimbursable under a provisional sum.

Diameters 300 mm and greater:

Pipelines shall be cleansed in sections and this shall be carried out by means of passing through polyurethane foam swabs. The swabs shall be to the approval of the Engineer.

Diameters less than 300 mm:
Pipelines shall be cleansed in sections by flushing with potable water, for a period of time to be decided by the Engineer's Representative.
Cleansing of any section shall be repeated as required by the Engineer's Representative in the event of the initial or subsequent operation not being to his satisfaction. The cost of such water shall be charged to the Contractor.
The Contractor shall supply all necessary equipment for the cleansing and sterilizing operations, including all swabs and swab detectors which shall be handed over to the Employer on completion of the Works.
Swabs shall be passed through pipelines at speeds of between 0.2 and 0.4 metres per second to obtain the best cleaning results with the minimum number of passes. Should it be apparent from the debris collected by the swab that damage to the lining has occurred, the Contractor shall be wholly responsible for repairing the lining to the satisfaction of the Engineer's Representative.

The swabbing operation shall be controlled by an experienced Engineer to ensure that no undue surges in the pipeline, heavy docking of the pig or pressurising of the pipeline occur causing damage to any of the permanent works. Any damage caused shall be made good by the Contractor to the satisfaction of the Engineer's Representative.

The Contractor shall make all necessary arrangements for the transportation of water from the point of supply from the Employer to the required location, and make all arrangements for the disposal of the water. All disposal methods and locations shall be to the approval of the Engineer's Representative.
When the pipelines have been cleansed to the satisfaction of the Engineer's Representative the Contractor shall introduce at a slow rate of water flow by a portable chlorinator or other approved means of a solution of sterilizing agent in such quantity and of such strengths as will result in the concentration of chlorine throughout the length of the pipelines of not less than 30 parts per million. This sterilizing charge shall be allowed to remain in the pipelines for 24 hours after which time the pipelines shall be thoroughly flushed using the supply water to remove chlorine in excess of that in the supply water.

When this flushing has been satisfactorily completed samples of water will be taken by the Engineer's Representative for bacteriological analysis by the Employer. If any of the results of the analysis are unsatisfactory when compared with those of the control sample of the supply water the sterilizing process shall be repeated until satisfactory results are obtained. On completion of sterilizing and flushing the pipelines shall be left full of supply water.
The Contractor shall be solely responsible for the provision of all labour, materials and chemicals necessary for carrying out the foregoing operations.

The cost of water used for repeated cleansing, sterilizing and flushing pipelines in accordance with this clause of the Specification will be charged to the Contractor and the Contractor shall be responsible for all temporary works and other arrangements in connection with cleansing, sterilizing and flushing the pipelines.
The costs of the initial sampling analysis and preparing reports on the bacteriological quality of the water shall be borne by the Employer but the costs of any subsequent sampling analysis and preparing reports should the initial reports be unsatisfactory shall be borne by the Contractor.

19. Painting

All steel or ductile iron pipes and fittings exposed to view including above ground pipelines shall be painted after making good the external protection with two coats of “Bitumastic Aluminum solution D. 5909” or similar approved.

Pipes and fittings in chambers shall be painted with two coats of “Bituros Solution” or similar approved. Valves and Surface Boxes shall be similarly painted.

SECTION 5: TUBE SETTLERS MODULE INSTALLATION

1. General

The requirement of this section shall apply to the construction and installation of tube Settlers' modules and its support framework.

Within this section 'Plant' refers to Galvanised steel bars, BRC Mesh, Pull tight Plastic seal bands, chain links and Tube settlers' modules, and other such materials required for installation of this modules.

All Plant shall be suitable for waterworks purposes for use under water with regard to the climatic conditions prevailing in Kenya and in particular at the location of the Works.

The Project Manager shall provide details of each plant with regard to Number of bars, Mesh diameter and aperture details, spacing rating and the approximate levels for fixing this module. The Contractor shall, in consultation with the Project Manager set out the proposed levels, making any changes that the Project Manager may deem necessary, confirming also the exact locations of all jointing/ welded joints, fixing of chain links and the like.

2. Leveling

The tube settlers' will be fitted at least 1 metre from the bottom of the water troughs and at least 2 metres above the discharge pipe of each clarifier to be provided in the drawings and approved by the Project Manager.

3. Handling, Storage and Transport of Plant

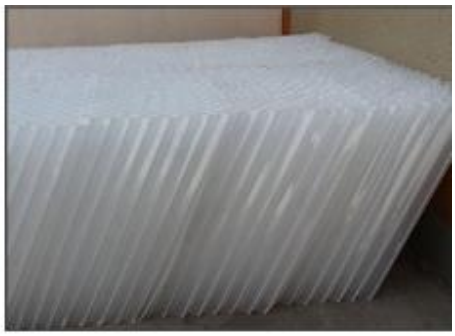
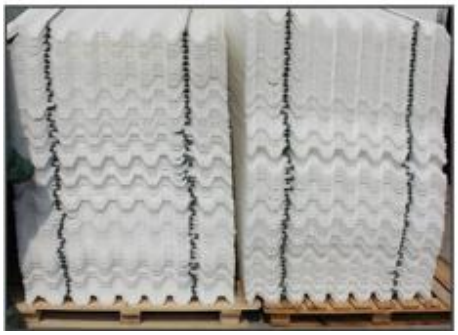
The loading, transporting, unloading and handling of Plant shall be carried out such that no damage is caused. With the recommendations from the manufacturer and to the approval of the Project Manager for all the above mentioned works, the use of lifting hooks is not permitted in handling stacked sheets. Forklift cranes/trucks shall be recommend while offloading the stacked sheets. All cradles and lashings shall be of such widths as to prevent damage to the coating of the sheets, or distortion of the sheets.

The tube settlers' module shall be transported in timber packing and where possible in the manufacturer's original packaging as shown in the image below.
Protective cover and other protective materials provided by the manufacturer shall not be permanently removed until immediately prior to installation.

In the event of any damage being caused to sheets or any plant, the Project Manager shall determine whether damaged piece shall be replaced or repaired. Repair to coating only shall be allowed and shall be as directed by the Project Manager.

When sheets are being loaded into vehicles care shall be taken to avoid their coming into contact with any sharp corners such as cope irons, loose nail heads, etc. Whilst in transit, pipes shall be well secured over their entire length and not allowed to project unsecured over the tailboard of the lorry.

These sheets shall be offloaded from Lorries using a suitable carnage. The figure below show typical packing, handling and transportation the tube modules.

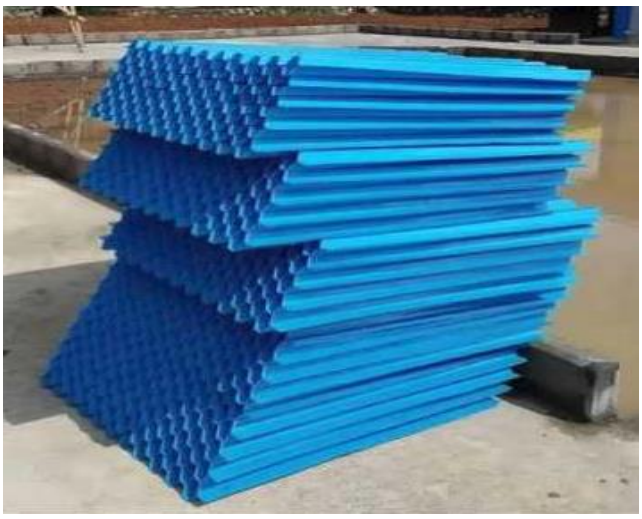





4. Storage Metal support components

Reinforcement i.e. the I beam sections, chain links and angle bars shall be stored on Site under cover and supported clear of the ground and in such manner as to make identification easy. Supports shall be such that distortion of the steel is avoided and contamination and corrosion prevented.

5. Tube settlers

Tube settlers are manufactured from PVC (polyvinylchloride) or PP (polypropylene) as shown on the drawings, and shall be of (560) IFR6024 - 24"(610mm) high x 12"(305mm) wide x 120"(3048mm) and the assemble will be as shown on below.



Site jointing of these sheets shall be made using either industrial glue for jointing plastic materials or application of heat plate on the edges of the sheets, this is done strictly in accordance with the manufacturer's instructions. The figures below show the two methods of jointing

Figure showing jointing of PVC sheets using industrial glue

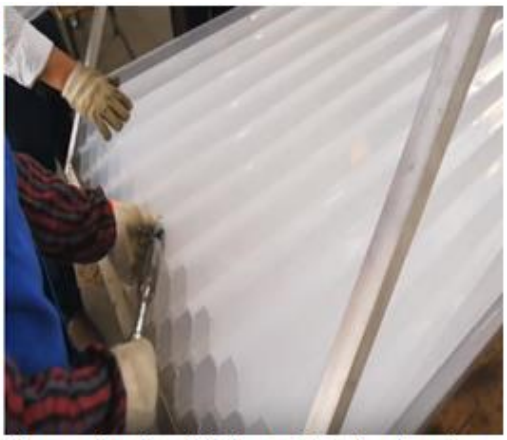


Figure showing jointing of PP sheets using hot plate on the edges

6. Binding and Fixing for Tube settlers

The assembled tube settlers will be arranged as follows in the (6) tanks which measuring 9.14m wide x 9.14m long (Old Sedimentation Plant):

Each tank will have 3 rows of 3.048m long modules to cover the tank length

Each tank will have 30 tube settlers that are 305mm wide nested side by side to cover tank width.

A sufficient quantity of sheets should be quoted to assemble the following amount of tube settlers 24"(610mm) high x 12"(305mm) wide x 120"(3048mm) long which includes extra modules for assembly/installation waste.

On-site-hand-glue Sets - (hand-glue applicators, tailor made stainless steel cages, modules compressing system, clips) to be provided together with tube settlers,

7. Steel Reinforcement

The nature of Steel Reinforcement to be used comprises of the following:

- Stainless steel 75x75x 2mm hollow sections –support frames
- Stainless steel anchorage and holding bolts

Steel Reinforcement shall be Structural Sections conforming to BS4: Part 1: 1993 and BS EN10056: 1999.

The Contractor shall obtain from his suppliers certificates of the mechanical and physical properties of the reinforcement and shall submit them to the Project Manager for approval, except where reinforcement has been supplied by the Employer.

8. Binding and Fixing

The Contractor shall provide on Site facilities for cutting and welding of the frame whether he is ordering this fabrication or not and he shall ensure that a token amount of frame bar is available on Site for fabrication as and when directed by the Project Manager.

Before assembling or fixing the frame the dimensions to which it has been bent shall be checked by the Contractor against the drawings. The frame shall be fixed in strict accordance with the drawings as regards cover, spacing and position, and suitable precautions shall be taken by the Contractor to prevent alteration of the frame supports during the placing and fixing in place on the existing concrete

Where required to support and retain the support frame in its correct position the Contractor shall provide templates, stools or other supports at his own cost. He shall allow for cutting to correct length all corner lacer bars.

All intersections of bars in walls and slabs and all connections between binders or links and main bars in columns or beams shall be tied with soft iron wire ties or with fixing clips.

Unless permitted by the Project Manager, welding of steel sections at intersections or for the joining of bars should be thoroughly checked. The welding process shall be carried out in accordance with the recommendations of the Institute of Welding for the welding of steel sections for steel construction.

9. Other Materials

9.1 Pull tight Plastic Seal bands

Hydrophilic rubber sealer shall be applied to the perimeter of all pipes to be built into concrete structures, to existing concrete walls and slabs at or below water levels which have been demolished and require extension, and to other locations as indicated on the Drawings

The pull tight Plastic seal bands specifications shall be as provided by the manufacturer's instruction as approved by the Project Manager.

9.2 PVC Copolymer Resin Solvent (Glue)

Mixing Toluene and Methyl Ethyl Ketone (MEK)

The solvent required to weld sheets to Brentwood standards or similar equivalent is a blend of industrial grade Toluene (50%)* and Methyl Ethyl Ketone (MEK) (50%)*. This solvent should be supplied to the site pre-mixed by the supplier.

SECTION 6. BUILDING AND STRUCTURES

1. Concrete Building Blocks

Concrete building blocks shall be of approved manufacture and shall be formed in a press. The blocks manufactured in Class C30 concrete shall be cured for at least 10 days before use. Blocks shall be well and evenly formed with true corners and unbroken arises, and shall be carefully handled and stacked.

From the quarries, high quality impermeable blue stone (Not Ndarugu pumiceous tuff) can also be used.

2. Laying Building Blocks

Joints between blocks shall be filled solid with mortar and shall be of regular thickness of 5 to 10mm. The blocks shall be laid in level courses and bonded so that each vertical joint is midway above the face of the block below, except at junctions and piers where a bond of not less than 100mm shall be provided. The walls shall be raised in lifts not exceeding three metres in height in any one day, and truly vertical. All blocks shall be wetted before being laid.

Joints of exposed work shall be raked out and neatly flush-pointed in the same mortar. The whole of the visible faces of the walls shall be left perfectly cleans and all surface mortar and droppings shall be removed before they have set.

Joints in work to be rendered shall be raked out to a depth of 8mm to provide a key for the rendering.

Blockwork shall be tied into adjoining structural members at the same level as blockwork reinforcement using 150mm long butterfly tangs or equivalent fixed and mortared into proprietary vertical strips.

3. Precast Concrete Units Generally

All precast concrete units shall include all fixing plugs and strips to enable screw ties or other fixing devices to be firmly attached. For all precast units to be set in block of masonry walls the plugs and strips shall be so positioned as to provide fixing at course and in no case exceeding 450mm centres.

4. Masonry Using Natural Irregular Stones

Stones shall come from selected quarry layers to the approval of the Engineer. They shall be homogeneous, frost resistant, flawless, free of any cracks or bousins, solid, and of equal grain and shall have all the required quantities to give a regular facing. They shall give out a clear sound when hit by a hammer.

Mortar shall be removed from the external surface of the wall. The Contractor shall prepare a wall sample approved by the Engineer which shall be kept at the construction site until all the masonry is completed.

5. Composition of Mortars

a. Cement mortar for bonding concrete shall be composed of cement and sand mixed in the proportion of the jointed concrete.

b. Cement mortar for setting precast concrete or pitching shall be composed of cement and sand mixed in the proportion of 50kg of cement to 0.14m3 of sand, with the addition of an approved plasticizer.

c. Cement mortar for blockwork in concrete blocks shall be composed of cement and sand mixed in the proportion of 50kg of cement to 0.14m3 of sand.

d. Sand and Cement for mortars shall be as described in the specification for concrete.

6. Mixing of Mortars

The materials of mortars shall be measured out in their correct proportions and shall first be thoroughly mixed together in a dry state by turning them over upon a clean wooden stage until they are of a homogeneous appearance in consistency and colour. Clean water shall then be added while the mixture is being turned over until it attains a suitable consistency. Plasticizer shall be added in accordance with the manufacturer's recommendations as approved by the Engineer.

The mortar shall be used immediately after it has been mixed. No mortar which has commenced its first set shall be used, or mixed up again. Mortar shall, where possible in hot weather, be protected from too rapid action by covering with impervious material such as polyethylene film.

Mixing by hand will be allowed only if the Engineer gives specific approval. Mixing by machine using the same sequence of operations described above shall be carried out whenever possible.

7. Cement Rendering

Rendering shall be in a 50 kg: 017-2-.20m3 cement: sand mix but where approval had been given to the use of a plasticizer or other additives these proportions may be modified to the approval of the Engineer.

All surfaces to receive a finishing coat of cement rendering or fine concrete shall be thoroughly prepared and cleaned and the rendering or screeding shall be placed immediately after such surfaces have been thoroughly wetted.

All rendering shall be put to a minimum of two coats, the first being left rough to a minimum of 10 mm thickness, but the second coat shall be trowelled up to a fair faces as soon as possible after it is applied.
All internal rendering shall be finished to an even and polished surface with a float, trowel or other suitable tool, special care being taken to obtain perfectly smooth and glazed faces. It shall not be less than 15mm thickness when finished unless instructed otherwise.

All external rendering shall be brought to an even surface with a wood float following which a tyrolean finish of approved colour shall be applied unless otherwise stated.

All rendering shall be protected from sun and rain by adequate and suitable coverings which shall be supplied and fixed in advance of these conditions arising. The renderings shall be kept damp while setting and protected from drying winds.

8. Tanking to Buried Concrete Surfaces

External concrete surfaces to be tanked shall be coated with a bituminous waterproofing membrane 3mm minimum thick. The tanking shall be dressed into structure and be protected by non-rotting boarding prior to backfilling.

9. Waterproof Rendering

Waterproof rendering slurry shall comprise a 50kg to 125kg cement sand mix with an approved waterproofing admixture such as styrene arcrylate copolymer.

The material shall block capillaries and minor shrinkage cracks to prevent water ingress while allowing the passage of water vapour through the structure.

The render shall be applied to a total thickness of not less than 20mm the first coat shall be applied leveled scratched and left to dry for not less than 3 days.

10. Joint Sealing Compound and Sealants

Joint sealing compounds shall be impermeable ductile materials of a type suitable for the conditions of exposure in which they are to be placed, and capable of providing durable, flexible and watertight seal by adhesion to the concrete throughout the range of joint movement.

Hot poured joint sealants shall comply with BS 2499, Ordinary Type A1 sealant.
Cold poured polymer-based joint sealants shall comply with BS 5212: Part 1, Normal Type N sealant.

Two part polysulphide based sealants shall comply with the relevant provisions of BS 4254. Pouring Grade shall be applied to horizontal upward facing joints and Gun Grade to joints of any other aspect or inclination. Other two part polymer based sealants of Gun or Trowel Grade shall comply with the physical and test requirements of BS 4254.

Silicon bases building sealants shall comply with the relevant provisions of BS 5889. Primers for use with joint sealants shall be compatible with, and obtained from the same manufacturers as, the adjacent sealant. Primers shall have no harmful effects on the concrete.

Sealants and primers which will be in contact with water to be used for potable supply shall not impart to water taste, colour, or any effect known to be harmful to health, and shall be resistant to bacterial growth. Sealants and primers which will be in contact with sewage or sewage sludge shall be resistant to biodegradation.

Section 7 Safety, Health and Environment

1. Introduction

The prevention of injury and/or illness to the site personnel and the public, damage to the Works and to public and private property, protection of the environment, and compliance with applicable laws, are primary objectives of the Employer. Because of the importance the Employer places on meeting these objectives, selected minimum requirements are outlined in these Safety, Health and Environmental Specifications with which Contractors shall comply while working on this contract. Given that these Specifications cannot cover every eventuality, the Contractor shall be expected to exercise good judgment in all such matters, even though not mentioned in these Specifications, and shall take any and all additional measures, as required or necessary, to meet his responsibility for safety, health and environmental matters during the period of the Contract.

The Employer nor its representatives shall not be held liable for any actions taken by the Contractor that are attributed to following the minimum requirements stated hereinafter. The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:

(a) Have full regard for the safety of all persons on the Site and keep the Site and the Works in an orderly state appropriate to the avoidance of danger to any person;

(b) Know and understand all laws governing his activities along with any site requirements and work site hazards. Such information shall be communicated by the Contractor to his personnel and subcontractors;

(c) Take all necessary measures to protect his personnel, the Employer's personnel, other persons, the general public and the environment;

(d) Avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequent of carrying out the Works.

2. Compliance with Specifications

The Contractor shall comply with the requirements of these Safety, Health and Environmental Specifications and all other applicable regulations or requirements under Kenyan laws, laid down by relevant authorities or issued by the Employer or the Engineer concerning safety, health and the environment, in force or introduced or issued from time to time during the period of the Contract.

In so far as these Specifications are applicable, they shall apply to sites and personnel outside the Site associated with the performance of the Contract.

The Specifications equally apply to subcontractors and all other parties engaged by the Contractor and their personnel. The Contractor shall ensure all such parties are fully aware of and comply with the Specifications.
The Contractor shall comply with all notifications and written or verbal instruction regarding safety issued pursuant to these Specifications by the Employer, Engineer or relevant authorities within the time specified in the notification or instruction.

The Contractor shall adopt a positive approach, awareness and responsibility towards safety, health and the environment, and take appropriate action, by:

(a) Ensuring the Specifications are enforced and followed by the Contractor's personnel. Any failure by the Contractor's personnel to follow the Specifications shall be regarded as a failure by the Contractor.

(b) Paying attention to possible injury to unauthorized persons entering the site, particularly children.

Whenever in these Specifications the Contractor is required to provide test certificates for equipment and personnel and to comply with the relevant authorities' requirements and no independent test facilities are available or no relevant authorities exist in Kenya, the Contractor shall provide:

(a) In lieu of independent test certificates:
- for equipment – details of the tests that have been carried out by the Contractor and a written statement that the Contractor has satisfied himself that the item of equipment is fit and safe for use;
- for personnel – details of the training and experience of the personnel and a written statement that the Contractor has satisfied himself that they have the required level of competency;

(b) In lieu of relevant authorities' requirements – details of the Contractor's own rules, regulations, requirements and procedures regarding safety, health and the environment.

If the Engineer is dissatisfied with the details provided by the Contractor, the Contractor shall provide further details or carry out further tests or provide further written statements as may be reasonably required by the Engineer.

When the Engineer has satisfied himself regarding the Contractor's own rules, regulations, requirements and procedures provided in accordance with (b) above, such rules, etc. shall be deemed to form part of these Specifications and to which Clause 3 shall equally apply.

3. Failure to Comply with Specifications

3.1 General

Should the Contractor fail to comply with any of the Specifications or requirements of the Engineer:

(a) The Engineer may suspend the Works of part of the Works until the Contractor has taken the necessary steps, to the satisfaction of the Engineer, to comply with the Specifications or requirements.

(b) The Employer may, following written notice to the Contractor, carry out themselves or arrange for another contractor to carry out such measures as they may consider appropriate on behalf of the Contractor. Any such actions by the Employer shall not affect or diminish the Contractor's obligations or responsibilities under the Contract.

(c) the Engineer may, by written notice of suspension to the Contractor, suspend all payment to the Contractor under the Contract if the Contractor fails to rectify any breach of the Specifications within the period specified by the Engineer, provided that such notice of suspension:

(i) Shall specify the nature of the failure or failures; and
(ii) Shall request the Contractor to remedy each such failure within a specified period after receipt by the Contractor of such notice of suspension.

Such suspension of payment shall remain in force until such time as the Contractor has rectified the breach or breaches to the satisfaction of the Engineer. No interest shall be paid on the suspended payments.

Failure to comply with the Specifications or requirements shall be considered a breach of the Contract by the Contractor and may result in termination of the Contract by the Employer. In the event of the Employer taking action based on this Clause, the Contractor shall not be entitled to any additional costs or extension to the Contract Completion Date. All costs incurred by the Employer pursuant to Sub-Clause 703.1.1 (b) shall be deducted from the amounts otherwise due to the Contractor.

4 General Requirements

4.1 Preamble

All references to safety shall be deemed to include health and the environment.

4.2 Safety Officer

The Contractor shall appoint a competent Safety Officer who shall be responsible for safety, health and the environment. The Safety Officer shall be given sufficient time by the Contractor to carry out his duties; minimum requirements shall be as follows:

Workforce on site of over 250	- full time Safety Officer;
Workforce on Site of 100 – 250	- 50% of Safety Officer's time;
Workforce on site below 100	- As required for the Works but a minimum of 5 hours per week of Safety Officer's time where more than 20 workers.

The Contractor shall provide the Safety Officer with appropriate identification, including a white hard hat with Red Cross symbol and an identification badge. The appointment of the Safety Officer shall be in writing and copied to the Engineer. The appointment shall include specific instructions to enforce these Specifications and delegated authority to take any action, measure or to issue instruction regarding their enforcement. All persons on Site shall be made aware of the name and authority of the Safety Officer and instructed to comply with any instruction or direction in safety matters, verbal or in writing issued by the Safety Officer.

The Safety Officer shall be provided with a mobile phone or other similar means of communication. The Safety Officer shall be accessible and available at all times including normal working hours.

4.3 Safety Training

The Contractor shall provide safety induction training for all site personnel upon starting on site.
The Contractor shall provide safety refresher/reinforcement training at regular intervals for his staff.

4.4 Safety Meetings

The Contractor shall hold regular safety meetings to provide safety instructions and receive feedback from site personnel on safety, health and environmental matters. A weekly safety Meeting shall be chaired by the Safety Officer and minutes shall be taken of the meeting. The meeting/minutes shall be given to the Engineer. The Safety Officer should attend the Contractor's weekly site meetings and "Safety" shall be an item on the agenda.

4.5 Safety Inspections

The Safety Officer shall make regular safety inspection of the work site. The Safety Officer shall prepare a report of each inspection. This report shall include details of all breaches of these Specifications and any other matters or situations relating to safety found during the inspection, instructions issued by the Safety Offices and actions taken by the Contractor. A copy of the Safety Officer's reports shall be given to the Engineer.

4.6 Control of Substances Hazardous to Health

Hazardous materials shall be stored in approved safety containers and handled in a manner specified by the manufacturers and/or prescribed by relevant authorities.

Only properly trained and equipped personnel shall handle hazardous materials.

4.7 Potential Hazards

The Contractor shall inform employees of potential hazards, take the appropriate steps to reduce hazards and be prepared for emergency situations. The Contractor shall make an assessment of every operation involving hazardous substances. The assessment shall be recorded on a Hazardous and Flammable Substances Assessment Method Statement which shall be submitted to the Engineer prior to the delivery and use of the substance on Site.

4.8 Accident Reporting

The Contractor shall report all accidents and dangerous occurrences to the Engineer. The Contractor shall prepare a report on each accident or dangerous occurrence and a copy of the report, together with witness statements and any other relevant information, shall be submitted to the Engineer. A reportable accident or dangerous occurrence shall include any accident to any person on site requiring medical attention or resulting in the loss of working hours or any incident that resulted, or could have resulted, in injury, damage or a danger to the Works, persons, property or the environment.

In the event of an accident or dangerous occurrence, the Contractor shall be responsible for completing all statutory notifications and reports. Copies of all statutory notifications and reports shall be passed to the Engineer.

All accidents and dangerous occurrences shall be recorded in a Site Accident Book. The Site Accident Book shall be available at all times for inspection by the Engineer.

The Contractor shall immediately rectify any situation or condition that could result in injury, damage or a danger to the Works, person, property or the environment. If the situation or condition cannot be corrected immediately, the Contractor shall provide temporary barriers and appropriate warning signs and devices and/or take other appropriate action necessary for the protection of persons, property and the environment.

4.9 Notices, Signs, Etc.

All safety, health, environmental and other notices and signs shall be clearly displayed and written in English. All requirements, instructions, procedures, etc. issued by the Contractor concerning these Specifications shall be printed in English and displayed and readily available to the Contractor's personnel.

4.10 First Aid and Medical Attention

The Contractor shall have comprehensive First Aid Kit(s) on Site at all times. First Aid Kits shall be conveniently located and clearly identifiable.

The Contractor shall have one employee on site trained in first aid for every 25 employees. Such persons shall be provided with appropriate identification, including a red hard hat with a white "red cross" symbol; and an identification badge.

The Contractor shall make contingency arrangements for calling a Doctor and transporting injured persons to hospital. The telephone numbers of the emergency services and the name, address and telephone number of the Doctor and nearest hospital shall be prominently displayed in the Contractor's site office.

4.11 Employee Qualification and Conduct

The Contractor shall employ only persons who are fit, qualified and skilled in the work to be performed. All persons shall be above the minimum working age. Contractor's personnel shall use the toilet facilities provided by the Contractor.

The Contractor shall ensure:

(a) That no firearms, weapons, controlled or illegal substances or alcoholic beverages are brought onto the Site and that no personnel under the influence of alcohol or drugs are permitted on Site.

(b) That all personnel obey warning signs, product or process labels and posted instructions.

(c) That drivers or operators of vehicles, machinery, plant and equipment follow the rules for safe operations. Drivers shall wear seat belts and obey all signs and posted speed limits.

5 Safety Requirements

5.1 Personal Protective Equipment

The Contractor shall provide personal protective equipment, including hard hats, safety glasses, respirators, gloves, safety shoes, and such other equipment as required, and shall take all measures or actions for the protection and safety of Contractor's personnel.

Non-metallic hard hats shall be worn at all times by all personnel at the worksite with the exception of those areas where the Engineer has indicated it is not necessary to do so. Safety glasses shall meet international standards and be available for use and worn in specified worksite areas.

As a minimum, safety glasses shall be worn for the following types of work: hammering, chipping, welding, grinding, use of electrically powered or pneumatic equipment, insulation handling, spray painting, working with solvents, and other jobs where the potential of an eye injury exists. Face shields and/or goggles shall be worn where possible exposure to hazardous chemicals, cryogenic fluids, acids, caustics or dust exists and where safety glasses may not provide adequate protection.
When handling acids, caustics and chemicals with corrosive or toxic properties, suitable protection, such as acid suits or chemical resistant aprons and gloves, shall be worn to prevent accidental contact with the substance.

Personnel shall not be permitted to work whilst wearing personal clothing or footwear likely to be hazardous to themselves or others.

The wearing of safety shoes with steel reinforced toes is recommended for all Contractor's personnel on site. In all cases, Contractor's personnel shall wear substantial work shoes that are commensurate with hazards of the work and the work site area.

Hearing protection, including muffs, plugs or a combination thereof, shall be provided for all personnel operating in areas where the noise level exceeds 90 decibels. Such protections shall also be provided for operators working with equipment exceeding such a level. This may include equipment such as excavators, shovels, jackhammers, saws, drills, grinders and the like are being used.

The Contactor shall encourage employees to wear substantial work gloves whenever practical and safe to do so.

5.2 Fire Protection and Prevention

The Contractor shall comply with fire protection instructions given by the Authorities having jurisdiction in regard to fire protection regulations. The Contractor shall, upon moving on site, provide to the Engineer and the Authorities a fire prevention and evacuation plan. This shall include drawing(s) showing the fire assembly points. The fire prevention and evacuation plan and drawing(s) shall be updated from time to time as the Works progress. The Contractor shall ensure all personnel are fully informed on escape routes and assembly points and any changes thereto.

Fuel storage will not be permitted in construction work areas. Contractors may establish fuel storage tanks in specified areas set aside for the purpose and approved by the Engineer. Storage tanks shall be adequately bunded to control spillage. Fire extinguishers shall be provided and installed in a suitable nearby location.

Highly combustible or volatile materials shall be stored separately from other materials and as prescribed by relevant authorities and under no circumstances within buildings or structures forming part of the permanent Works. All such materials shall be protected and not exposed to open flame of other situations which could result in a fire risk.
No combustible material shall be located inside or within 10 metres of a building if structure forming part of the permanent Works. Where units have to be used in these circumstances,

they shall be constructed of non-combustible materials and have a half-hour fire rating inside to outside and outside to inside. Non-combustible furniture shall be used where practical.
All temporary accommodation and stores shall be provided with smoke detectors and fire alarms.

Smoking shall be banned in high risk areas.

Expanded polystyrene with or without flame retarding additive, polythene, cardboard and hardwood shall not be used as protection materials. Plywood and chipboard shall only be used as protection on floors. Vertical protection shall be non-combustible. Debris netting and weather protection sheeting shall be fire retardant.

When using cutting or welding torches or other equipment with an open flame, the Contractor shall provide a fire extinguisher close by at all times. All flammable materials shall be cleared from areas of hot works or work locations prior to welding or oxy/gas burning operations. All hot works shall cease half an hour before the end of a work shift to allow for thorough checking for smouldering materials. Where appropriate, areas of hot works are to be soused in water before the shift ends.
An adequate number of fire extinguishers of types suited to the fire risk and the material exposed shall be provided. These shall be placed in accessible, well-marked locations throughout the job site. Contractor's personnel shall be trained in their use. Extinguishers shall be checked monthly for service condition and replaced or recharged, as appropriate after use.

Only approved containers shall be used for storage, transport and dispensing of flammable substances. Portable containers used for transporting or transferring gasoline or other flammable liquids shall be approved safety cans.
Fuel burning engines shall be shut off while being refuelled. Adequate ventilation to prevent an accumulation of flammable vapours shall be provided where solvents or volatile cleaning agents are used.

Flammables shall not be stored under overhead pipelines, cable trays, electrical wires or stairways used for emergency egress. Paints shall be stored and mixed in a room assigned for the purpose. This room shall be kept under lock and key.
Oily waste, rags and other such combustible materials shall be stored in proper metal containers with self-closing lids and removed every night to a safe area or off site. Every precaution shall be taken to prevent spontaneous combustion.

5.3 Electrical Safety

All temporary electrical installations, tools and equipment shall comply with current regulations dealing with on-site electrical installations. The Contractor shall establish a permit-to-work system for work in or in proximity to energized circuits of any voltage. Contractor's personnel shall not commence work on such circuits unless a permit to work has been issued and adequate safety measures have been taken and the work operation has been reviewed and approved by the Engineer.

Only authorized personnel shall be allowed to work or repair electrical installations and equipment. Portable tools and equipment shall be 240 volt, unless otherwise agreed by the Engineer.

When portable or semi-portable equipment operates at voltages in excess of 240 volts, the supply shall be protected by a Residual Current Device (RCD) regardless of any such device fitted to the equipment. The RCD must have a tripping characteristic of 30 milliamps at 30 milliseconds maximum.

All static, electrically powered equipment, including motors, transformers, generators, welders and other machinery, shall be properly earthed, insulated, and/or protected by a ground fault interruption device. In addition, the skin metal buildings and trailers with electric service shall be earthed. Metal steps, when used shall be securely fixed to the trailer.
Lamp holders on festoon lighting shall be moulded to flexible cable and be of the screw in type. Clip on guards shall be fitted to each lamp unit.

All tungsten-halogen lamps shall be fitted with a glass guard to the element. These lamps must be permanently fixed at high level.
Electrical equipment shall be periodically inspected and repaired as necessary by competent persons.
Any work in electrical equipment and systems shall be made safe through locking, tagging, and/or isolation of the equipment before work commences. Prior to the start of the work, the equipment or systems shall be tested to ensure that they have been properly de-energised and isolated.

Electrical repair work on energized systems shall be avoided whenever possible.
Electrical trouble shooting shall be conducted only after getting written approval of the Engineer.

Unauthorized personnel shall not enter enclosures or area containing high voltage equipment such as switchgear, transformers or substations.

5.4 Oxygen/Acetylene/Fuel Gases/Cartridge Tools

Compressed oxygen shall never be used in the place of compressed air. Flash-back (Spar) arrestors shall be fitted to all gas equipment. Liquid petroleum Gas (LPG) cylinders shall not be stored or left in areas below ground level overnight. Cylinders must be stored upright.

The quantity of oxygen, acetylene and LPG cylinders at the point of work shall be restricted to a maximum of one day's supply. Cylinders shall be kept in upright vertical rack containers or be safely secured to a vertical support.

Cartridge tools shall be of the low velocity type. Operators must have received adequate training in the safe use and operation of the tool to be used.

5.5 Scaffolding/Temporary Works

No aluminum tube shall be used, except for proprietary mobile towers, unless otherwise agreed with the Engineer.
Drawings and calculations shall be submitted to the Engineer, prior to commencement of work on the site, for all Temporary Works, including excavations, falsework, tower cranes, hoists, services and scaffolding. Designs shall conform to international standards.
The Engineer will not approve Temporary Work designs but the Contractor shall take account of any comments on such designs made by the Engineer.

The Contractor shall inspect and approve all Temporary Works after erection and before access, loading or use is allowed. Completed and approved Temporary Works shall be tagged with a scaff-tag or similar safety system and the Safe Structure insert displayed. For scaffolding, one tag shall be displayed every 32 m^2 of face area. A central record system shall be kept on all Temporary Work. Temporary Works shall be inspected weekly and similarly recorded.
All mobile scaffold towers shall be erected in accordance with the manufacturer's instructions and a copy of these shall be submitted to the Engineer prior to any use on site. Additionally, all towers shall be erected complete with access ladder, safety rails and kick boards whatever the height.
The Contractor shall repair or replace, immediately, any scaffold, including accessories, damaged or weakened from any cause.
The Contractor shall ensure that any slippery conditions on scaffolds are eliminated as soon as possible after they occur.

All scaffolds used for storing materials, for brick or block laying, for access to formwork or for any other purpose where materials may be accidentally fall, shall be provided with wire mesh guards of a substantial material, in addition to kick boards.

5.6 Use of Ladders

Manufactured ladders shall meet the applicable safety codes for wood or metal ladders. Metal ladders shall not be used where there is any likelihood of contact with electric cables and equipment. All metal ladders shall be clearly marked: "Caution – Do not use around electrical equipment". Job made ladders shall not be permitted.

Extension or straight ladders shall be equipped with non-skid safety feet, and shall be no more than 12 m in height. The maximum height of a step ladder shall be 2 m. Ladders shall not be used as platforms or scaffold planks.

Ladders rungs and steps shall be kept clean and free of grease and oil.
Extension and straight ladders shall be tied off at the top and/or bottom when in use. Only one person shall be allowed in a ladder at a time.

Defective ladder shall be taken out of service and not used. Ladders shall not be painted and shall be inspected for defects prior to use.

5.7 Elevated Work

The Contractor shall provide all personnel, while working at an elevated position, with adequate protection from falls. Details of such protections shall be submitted to the Engineer. The Contractor shall carry out daily inspections of all elevated work platforms. Defects shall be corrected prior to use.

5.7.1 Roofing and Sheet Metal Laying

(a) A Method Statement detailing the procedures to be adopted shall be submitted to and agreed with the Engineer prior to commencement of work on the site.
(b) Mobile elevating work platforms or the equivalent shall be used to install roofing and sheet materials wherever practicable and a suitable base is available.

5.7.2 Erection of Structures

(a) A Method Statement detailing the procedures to be adopted shall be submitted to and agreed with the Engineer prior to commencement of work on the site.
(b) Safety harness and lines shall be provided by the Contractor for use by the erection personnel and worn at all times.
(c) Mobile elevating work platforms or the equivalent shall be used to erect structures wherever practicable and a suitable base is available.

5.7.3 Mobile Elevating Work Platforms

Operators shall be trained in the safe use of such platforms and hold a current Certificate of Competence.

5.7.4 Hoists

(a) A copy of the current Test Certificate shall be submitted to the Engineer before any hoist (personnel or material) is brought into operation on the site. Where the range of travel is increased or reduced a copy of the revised Test Certificate shall be submitted.
(b) Each landing gate shall be fitted with a mechanical or electrical interlock to prevent movement of the hoist when any such gates is in the open position.
(c) Safety harness must be worn and used by personnel erecting, altering and dismantling hoists.

5.7.5 Suspended Cradles

(a) Suspended cradles shall be installed, moved and dismantled by a specialist contractor.
(b) Suspended cradles shall comply with local regulations.
(c) All powered suspended cradles shall incorporate independent safety lines to overspeed braking devices and independent suspension lines for personal safety harness attachment.

5.8 Use of Temporary Equipment

The safe design of any piece of equipment shall not be exceeded, nor shall the equipment be modified in any manner that alters the original factor of safety or capacity. Mobile equipment shall be fitted with suitable alarm and motion sensing devices, including back-up alarm, when required. The Contractor shall ensure that the installation and use of equipment are in accordance with the safety rules and recommendations laid down by the manufacturer, taking into account the other installations already in place or to be installed in the future.

The contractor shall inspect Equipment prior to its use on the Works and periodically thereafter to ensure it is in safe working order. Special attention shall be given to such items as cables, hoses, guards, booms, blocks, hooks and safety devices. Equipment found to be defective shall not be used and immediately removed from services, and a warning tag attached.

Natural and synthetic Fibre rope made of material such as manila, nylon, polyester, or polypropylene shall not be used as slings. Only trained, qualified and authorized personnel shall operate equipment. All drivers and operators shall hold a current Certificate of Training Achievement for the equipment being used. A safety observer shall be assigned to watch movements of heavy mobile equipment where hazards may exist to other personnel from the

movement if such equipment, or where equipment could hit overhead lines or structures. The observer shall also ensure that people are kept clear of mobile equipment and suspended tools.

When mobile or heavy equipment is travelling onto a public thoroughfare or roadway, a flagman shall ensure that traffic has been stopped prior to such equipment proceeding. While the mobile or heavy equipment is travelling on a public roadway, a trailing escort vehicle with a sign warning of a slow-moving vehicle that is dangerous to pass shall be provided.

5.9 Cranes:

(a) The Contractor shall give a minimum of 48 hours' notice to the Engineer prior to bringing a crane on site.

(b) No cranes shall be erected in the site without the prior approval of the Engineer. The Engineer may direct the Contractor as to location where cranes may not be located. The Contractor shall take such directions into account when submitting his proposals for crane location points, base footings, pick up points and swing radius. Compliance with any such direction shall not entitle the Contractor to any extension of the Period of Completion or to any increase of the Contract Price.

(c) Safety harness shall be worn and used at all times by personnel engaged on the erection, alterations and dismantling of tower cranes.

(d) The Contractor shall provide a copy of the current Test Certificate (see Sub-Clause 702.5) to the Engineer before any crane (tower or mobile) is brought into operation on the Site.

(e) All lifting tackle must hold a current Test Certificate. All lifting tackle must be thoroughly examined every 6 months and an inspection report raised.

(f) All fibrous/web slings shall be destroyed and replaced 6 months after first use.

(g) All crane drivers/operators shall hold a Certificate of Training Achievement for the class of crane operated.

(h) All banksman/slingers shall hold a Training Certificate from a recognized training agency.

(i) The maximum weekly working hours of a crane driver or banksman shall be restricted to 60 hours.

(j) Under no circumstances shall a crane or load come within 4 m of any energized overhead power line or other critical structure.

5.10 Locking-out, Isolating and Tagging Equipment.

Equipment that could present a hazard to personnel if accidentally activated during the performance of installation, repair, alteration, cleaning, or inspection work shall be made inoperable and free of stored energy and/or material prior to the start of work. Such equipment shall include circuit breakers, compressors, conveyors, elevators, machine tools, pipelines, pumps, valves, and similar equipment.

Where equipment is subject to unexpected external physical movement such as rotating, turning, dropping, falling, rolling, sliding, etc., mechanical and/or structural constraints shall be applied to prevent such movement.

Equipment which has been locked-out, immobilized, or taken out of services for repair or because of a potentially hazardous condition shall be appropriately tagged indicting the reason it has been isolated and/or taken out of service.

Where safety locks are used for locking out or isolating equipment, the lock shall be specially identified and easily recognized as a safety lock.

5.11 Installation of Temporary or Permanent Equipment

During installation and testing the Contractor's specialists Engineer shall be in attendance. All control mechanism panel and wiring diagrams shall be available and printed in English.

5.12 Laser Survey Instruments

Details of the types and use of laser instruments shall be submitted and agreed with the Engineer.

5.13 Working in Confined Spaces

Confined spaces, including tanks, vessels, containers, pits, bins, vaults, tunnels, shafts, trenches, ventilations ducts, or other enclosures where known or potential hazards may exist, shall not be entered without prior inspection by and authorization from the Site Safety Officer and the issuance of a Hazardous Work Permit.

Prior to entering the confined space, the area shall be completely isolated to prevent the entry of any hazardous substances or materials which could cause an oxygen deficient atmosphere. All equipment that could become energized or mobilized shall be physically restrained and tagged. All lines going into the confined space shall be isolated and/or blanked.
Personnel working in a confined space where emergency escape or rescue could be difficult, shall wear a safety harness attached to a lifeline. A qualified attendant(s), trained and knowledgeable in job-relater emergency procedures, shall be present at all times while persons are working within the confined space.
The attendant shall be capable of affecting a rescue, have necessary rescue equipment immediately available, and be equipped with at least the same protective equipment as the person making entry.

All equipment to be used in a confined space shall be inspected to determine its acceptability for use. Where a hazard from electricity may exist, equipment utilized shall be of low voltage type. The atmosphere within the confined space shall be tested to determine if it is safe to enter. Acceptable limits are:

- oxygen: 19.5% lower, 22% higher;
- flammable gas: not to exceed 10% of lower explosion limit;
- Toxic contaminants: not to exceed the permissible exposure limit.

Subsequent testing shall be done after each interruption and before re-entering the confined space, as well as at intervals not exceeding 4 hours. Continuous monitoring is preferable and may be necessary in certain situations.

Adequate ventilation shall be provided to ensure the atmosphere is maintained within acceptable limits.

5.14 Demolition

A detailed Method Statement detailing the demolition procedures/techniques to be used shall be submitted to and approved by the Engineer prior to commencement of work on site.

The Method Statement must include full details of measures to be taken to ensure that there are no persons remaining in the building/structure and to distance members of the public and Contractor's personnel from the building/structure prior to demolition.

5.15 Excavation and Trenching

An excavation permit signed by the Engineer must be issued before excavation proceeds in any work location. The contractor shall investigate and identify the location of existing services by study of the drawings, a visual/physical study of the site, sweeping by appropriate detection equipment and where necessary hand excavation of trial holes.
Following this investigation, the Contractor shall submit a written request for an excavation permit to the Engineer.

The Engineer will return the permit signed and dated to indicate:

- Services which are to be maintained.
- Services which are to be isolated.
- Any special precautions to be taken.

A sample Excavation Permit is given in Annex 1 to this Specification. The issue of an Excavation Permit by the Engineer shall not relieve the Contractor of his responsibilities under the Contract.

The side of all excavations and trenches which in the opinion of the Engineer might expose personnel or facilities to danger resulting from shifting earths shall be protected by adequate temporary supports or sloped to the appropriate angle of repose.

All excavations, slopes and temporary supports shall be inspected daily and after each rain, before allowing personnel to enter the excavation.

Excavations 1.3 metres or more in depth and occupied by personnel shall be provided with ladders as a means for entrance and egress. Ladders shall extend not less than 1 metre above the top of the excavation.

The Contractor shall provide adequate barrier protection to all excavations. Barriers shall be readily visible by day of night.

Excavated or other materials shall be stored at least 0.65 metres from the sides of excavations.

5.16 Concrete Reinforcement Starter Bars

The Contractor shall ensure concrete reinforcement starter bars are not a danger to personnel. Where permitted by the Engineer, starter bars shall be bent down. Alternatively, the starter bars shall be protected using either hooked starters, plastic caps, plywood covers or other methods agreed with the Engineer.

6 Environmental and Health Requirements

6.1 Protection of the Environment

The Contractor shall be knowledgeable of and comply with the Environmental Management Plan (EMP) and with all environmental laws, rules and regulations for materials, including hazardous substances or wastes under his control. The contractor shall not dump, release or otherwise discharge or dispose of any such materials without the authorization of the Engineer.

Any release of a hazardous substance to the environment, whether air, water or ground, must be reported to the Engineer immediately. When releases resulting from Contractor action occur, the Contractor shall take proper precautionary measures to counter any known environmental or health hazards associated with such release. These would include remedial procedures such as spill control and containment and notification of the proper authorities.

6.2 Air Pollution

The Contractor, depending on the type and quantity of materials being used, may be required to have an emergency episode plan for any releases to the atmosphere. The Contractor shall also be aware of local ordinances affecting air pollution.

The Contractor shall take all necessary measures to limit pollution from dust and any wind-blown materials during the Works, including damping down with water on a regular basis during dry climatic conditions.
The contractor shall ensure that all trucks leaving the Site are properly covered to prevent discharge of dust, rocks, sand, etc.

6.3 Water Pollution

The contractor shall not dispose of waste solvents, petroleum products, toxic chemicals or solutions on the city drainage system or watercourse, and shall not dump or bury garbage on the Site. These types of waste shall be taken to an approved disposal facility regularly, and in accordance with requirements of relevant Authorities. The Contractor shall also be responsible for the control of all run-offs, erosion, etc.

6.4 Solid Waste

6.4.1 General Housekeeping

(a) The Contractor shall maintain the site and any ancillary areas used and occupied for performance of the Works in a clean, tidy and rubbish-free condition at all times.

(b) Upon the issue of any Taking-Over Certificate, the Contractor shall clear away and remove from the Works and the Site to which the Taking-Over Certificate relates, all Contractor's Equipment, surplus material, rubbish and Temporary Works of every kind, and leave the said Works and Site in a clean condition to the satisfaction of the Engineer. Provided that the Contractor shall be entitled to retain on Site, until the end of the Defects Liability Period, such materials, Contractor's Equipment and Temporary Works as are required by him for the purpose of fulfilling his obligations during the Defects Notification Period.

6.4.2 Rubbish Removal and Disposal

(a) The Contractor shall comply with statutory and municipal regulations and requirements for the disposal of rubbish and waste.

(b) The Contractor shall provide suitable metal containers for the temporary storage of waste.

(c) The Contractor shall provide suitable metal containers from site as soon as they are full. Rubbish containers shall not be allowed to overflow.

(d) The Contractor shall provide hard standings for and clear vehicle access to rubbish containers.

(e) The Contractor shall provide enclosed chutes of wood or metal where materials are dropped more than 7 metres. The area onto which the material is dropped shall be provided with suitable enclosed protection barriers and warning signs of the hazard of falling materials. Waste materials shall not be removed from the lower area until handling of materials above has ceased.

(f) Domestic and biodegradable waste from offices, canteens and welfare facilities shall be removed daily from the site.

(g) Toxic and hazardous waste shall be collected separately and be disposed of in accordance with current regulations.

6.4.3 Asbestos Handling and Removal

The Contractor shall comply with all local regulations regarding the handling of asbestos materials. In the absences of local regulations, relevant International Standards shall apply.

6.4.4 Pest Control

The Contractor shall be responsible for the rodent and pest control on the Site. If requested, the contractor shall submit to the Engineer, for approval, a detailed programme of the measures to be taken for the control and eradication of rodents and pests.

6.5 Noise Control

The Contractor shall ensure that the works is conducted in a manner so as to comply with all restrictions of the Authorities having jurisdiction, as they relate to noise.

The Contractor shall, in all cases, adopt the best available plant/and or machinery shall be used. All equipment shall be maintained in good mechanical order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable. Stationary noise sources shall be sited as far away as possible from noise-sensitive areas and, where necessary, acoustic barriers shall be used to shield them. Such barriers may be proprietary types, or may consist of site materials such as bricks or earth mounds as appropriate.

Compressors, percussion tools and vehicles shall be fitted with effective silencers of a type recommended by the manufacturers of the equipment. Pneumatic drills and other noisy appliances shall not be used during days of rest or after normal working hours without the consent of the Engineer.

Areas where noise levels exceed 90 decibels, even on a temporary basis, shall be posted as high noise level areas.

7 Additional Requirements for Work in Public Areas

7.1 General

Those additional requirements shall apply to all works carried out in Public Areas.
Public Areas are defined as areas still used by or accessible to the public. These include public roads and pavements, occupied buildings and areas outside the Contractor's boundary fencing.
All work in Public Areas shall be carried out to minimize disturbance and avoid dangers to the public.
Before commencing work, the Contractor shall ensure that all necessary resources, including labour, plant and materials will be available when required and that the works will proceed without delays and be completed in the shortest possible time. Period of inactivity and slow progress or delays in meeting the agreed programme for the Works, resulting from the Contractor's failure to provide necessary resources or other causes within the control of the Contractor, will not be accepted. In the event of such inactivity, slow progress or delays, the Contractor shall take immediate action to rectify the situation, including all possible acceleration measures to complete the works within the agreed programme.
Details of the actions and acceleration measures shall be submitted to the Engineer. If the Engineer is dissatisfied with the Contractor's proposals, the Contractor shall take such further actions or measures as required by the Engineer. All costs incurred shall be the responsibility of the Contractor.

7.2 Method Statement

The Contractor shall submit to the Engineer a method statement for each separate area or work in Public Areas. The Method Statement shall include:

(a) A general description of the Works and methodology of how it will be carried out.

(b) Details of the measures and temporary works to minimize disturbance and safeguard the public. These shall include temporary diversions, safety barriers, screens, signs, lighting, watchmen and arrangements for control of traffic and pedestrians and advance warning to be given to the public.

(c) Details of temporary reinstatement and maintenance of same prior to final reinstatement.

(d) For works involving long lengths of trenches or works to be completed in sections, the lengths or sections of each activity (e.g. up to temporary reinstatement, final reinstatement) to be carried out at any one time.

(e) Details of the availability of necessary resources (labour, plant, materials, etc.) to complete the work.

(f) A programme showing start and completion dates and period for all activities of each length or section, including temporary works, and the works overall.

(g) Such further information as necessary or required by the Engineer.

The Contractor shall not commence work, including temporary works, until after the approval of the Contractor's Method Statement by the Engineer.

Method Statements shall be updated bases on actual progress or as and when required by the Engineer.

7.3 Closure of Roads, Etc.

The closure or partial closure of roads, pavements and other public areas will only be permitted if approved by the Engineer and Relevant Authorities. The Contractor shall detail for each closure the extent of area to be closed, the reasons and duration of the closure, and where appropriate, proposed diversions. A sample Street Closure Permit is given at Annex 2 to this Specification.

7.4 Trench and Other Excavations

The requirements covering trench and other excavations will depend on the location and type of the excavation and the potential risks to the public.
The following guidelines apply particularly to trenches but shall also apply to other types of excavations:

(a) before commencing work the Contractor shall:
- Notify the Engineer of the location and duration of the work. An excavation permit signed by the Engineer must be issued in accordance with Sub-Clause 705.16 before excavation proceeds in any work location;
- Obtain permission from relevant authorities including the police when required;
- Erect all temporary works such as barriers, warning signs, lighting, etc.;
- Have available adequate materials for temporary supports to sides of excavations and necessary labour, plant and materials to complete the work within the shortest possible time.

(b) in carrying out the works the Contractor shall, unless otherwise permitted or required by the Engineer:
- Not open more than one excavation within a radius of 250 metes;
- Limit the length of trench excavation open at one time to 150 metres;
- Maintain and alter or adapt all temporary works including supports to sides of excavations;
- Remove all surplus excavated material the same day it is excavated;
- Complete the works, including final reinstatement within ten days;
- Where final reinstatement is not achieved within the required time, to carry out temporary reinstatement;
- Ensure that any temporary reinstatement is maintained at the correct level until final reinstatement is achieved.

The above guidelines shall not relieve the Contractor of his obligations and responsibilities.

7.5 Safety Barriers

Safety barriers shall be provided to the perimeter of work areas and to trench and other types of excavations and to existing openings such as manholes, trial pits and the like. When exposed to the public, safety barriers shall be provided to both sides and ends of trenches and around all sides of openings.

The Contractor shall provide details of the type or types of safety barriers for each excavation for the approval of the Engineer prior to commencing work. No work shall commence until the safety barriers are in place.

The type of safety barrier used shall be appropriate to the particular location and the potential risks to the public. Examples of different types of safety barriers are given below:

- Type 1 - excavated material;
- Type 2 - non-rigid barrier of rope or florescent tape strung between metal rods driven into the ground;
- Type 3 - rigid barrier of timber, steel or concrete. Such barriers could be in the form of horizontal rail(s) or sheet material secured to posts driven or concreted onto the ground.

The following are guidelines on the type of safety barriers that could be used in differing situations. They apply particularly to trenches but also apply to other types of excavation, existing openings onto the perimeter of work areas:

- Areas not subject to vehicular traffic - Types 1 or 2;
- Roadways (low traffic speed) - Types 1 or 2;
- Roadways (high traffic speed or where excavation are greater than 2 m) - Type 3.

The above examples of the types of barriers and the guidelines on situations in which they could be used shall not relieve the Contractor of his obligations and responsibilities.

8 Contractor's Site Check List

A sample Contractor's Site Check List is included in Annex 3 to this Specification. This is included to assist contractors should they wish to introduce such a system as part of their site management procedures. The list is not exhaustive and further items will need to be added by the Contractor.
The list is issued for guidance only, and does not, in any way, revise or limit the requirements covered elsewhere in these Specifications.

9 Miscellaneous

9.1 General

The Contractor is referred to the drawings as to the general character of the works and he shall allow in his rates for any reason of the work being in detached positions, in small quantities, difficulty of access or for any other cause. He should also make due allowance for specialist installations taking place during the currency of this contract.
This section of the specification refers to miscellaneous items. Clauses elsewhere in the specification shall be followed where relevant.

9.2 Bondies Ties

Bonding ties shall be 75mm wide x 250mm long Galvanised bitumen - coated expanded metal strip, cast 100mm into concrete surface in contact with block work. The bonding tie used shall be approved by the Engineer.

9.3 Precast Lintels

All precast items shall be marked with the date of casting and shall not be built until they have matured for 28 days. Ends of bar reinforcement shall be hooked. The cover for reinforcement shall be 25mm from internal faces and 38mm from external exposed faces. The top of lintels shall be numbered for identification.
Lintels shall have timber or pre-formed inserts cast in for fixing metal windows where required and shall have fair face finish on all surfaces exposed to view and hacked surfaces where plastered.

9.4 Blockwork

Building blocks shall be dense concrete blocks complying with the requirements of SRN 804 with faces for plastering and having a compressive strength of 14 N/sq.mm
Blocks shall be obtained from an approved manufacturer and shall be equal to sample blocks previously approved by the Engineer.
Blocks shall be carefully handled and stored on site and protected from the weather at all times.
Surfaces on which blockwork is to be built shall be kept clean. Blocks shall be well wetted before being laid and the tops of walls where blockwork has been left shall be well wetted before re-commencing. Blockwork shall be built plumb, true to line and level, with all perpendiculars vertical and in line. Block shall be built in half bond and alternate -courses shall be block bonded at all junctions, no cut block shall be less than half block. Joints in concrete blockwork shall be well filled with gauged mortar and shall not exceed 10mm in width.

9.5 Damp - Proof Course (Dpc)

Hessian based metal cored bitumen for- damp-proof course shall be lead cored, complying with SRN 803 weighing not less than 4. 4kg per square metre. Damp - proof course shall be bedded horizontally in mortar as for blockwork with 115mm laps in length and full laps at angles.

9.6 Hardwood

Hardwood for joinery shall be sound, well-conditioned and seasoned hardwood complying with the requirements of SRN 816. A sample of each representative section for use in the work shall be previously submitted by the contractor for approval by the Engineer. Moisture content shall be 12 (+ or- 2%)

9.7 Plywood

Plywood generally shall comply with SRN 811. That from sources not included in SRN 811 shall be of corresponding grades of veneers and types of bonding. Plywood for flush doors shall be Grade 1- hardwood veneered.

9.8 Doors

Internal doors shall be hardwood framed solid cored flush doors constructed in accordance with SRN 817, faced both sides with 3mm thick hardwood veneered plywood and lipped all round with matching hardwood lipping. Moisture content at delivery shall be 12% (+ or - 2%).

9.9 Frames and Linings

Door frames and linings shall be class 1 hardwood mortise and tendon jointed at angles. Sub-frames for internal doors shall be Class 1 hardwood tongued at angles.

9.10 Architraves and Stops
Architraves and stops shall be Class 1 hardwood matching to the frames and linings.

9.11 Ironmongery
All ironmongery shall be obtained from a source approved by the Engineer. Samples shall be submitted before ordering and the articles ordered shall match up with the approved samples. Screws of a like metal shall be used for all fittings.

9.12 Joinery
All exposed joiner's work shall have wrought faces. The prices of all joiner's work shall include for slightly rounded arises.
Where the term framing or framed is made use of it shall be understood to mean all halvings, dovetails, tendons and hardwood pins and the best known means of putting the work together.
All framed work shall be put together loosely and stacked under cover where a free current of air can circulate and is not to be wedged and glued until it is required for fixing.
All joinery, when brought on the works, shall be stacked under cover. The Engineer or his representative, shall have full right of access to the joinery works and power to condemn any work not approved and any approval expressed or implied is not to relieve the contractor from his responsibility and liability to make good any shrinkage or other defects that may appear after the work is fixed.
All joinery to be painted shall be knotted and primed.
The Contractor shall provide all materials, labour, framing, fixing, etc., nails, screws and everything necessary for the proper execution and completion of the work.

9.13 Fixing Joinery
Doors shall be hung on one or one and a half pairs of butt hinges to give a maximum even tolerance of 2mm all round.
Sub-frames shall be fixed to blockwork with three fixing clamps per side and one dowel let 50mm into floor and d50mm into foot of each leg. Linings shall be fixed after completion of other finishing by means of screwing and pellating to sub-frames with matching hardwood pellates. Architraves and stops shall be pinned on, heads punched and filled with tinted filler.

9.14 Fixing Ironmongery
The rates for supplying and fixing ironmongery shall include for all sinking, boring, mortising etc., making good, replacing damaged screws, oiling, adjusting and leaving in good working order and for mastering all keys.

9.15 Bolts and Nuts
Bolts and nuts shall comply with the relevant requirements for the Standards as set out below:
Black Hexagon Bolts, Screws and Nuts SRN 914
Metal Washers for General Purpose SRN 925
Black Cup and countersunk Head Bolts and Screws with nuts SRN 932
The items shall preferably have coarse metric threads but items with B.S.W. or approved equivalent threads may be used. Bolt lengths shall be sufficient to ensure that nuts are full threaded when tightened in their final position.

9.16 Structural Steelwork
The whole of the structural steelwork and testing shall comply with the relevant clauses of SRN 863. The Contractor shall include for the preparation of all shop details from the

drawings supplied by the Engineer. All such details shall be approved in writing by the Engineer before the work is put in hand. Every drawing shall show the number and sizes of all rivets and bolts, compete details of welds, type of electrodes, welding procedure, whether the welds are to be made in the shop or elsewhere and any other relevant information. The Contractor shall be responsible for the accuracy of his shop details and for shop fittings and site connections.

The Contractor shall take the dimensions from the structure and he shall verify all dimensions given on the drawings before the work is put in hand.
Any damage to materials on the site due to inadequate precautions being taken during the erection of the steelwork shall be made good to the satisfaction of the Engineer at the Contractor's expense.
The fabrication and erection of the steelwork shall be carried out in accordance with SRN 863.

9.17 Galvanized work
Iron and steel, where galvanized, shall comply with SRN 903, entirely coated with zinc after fabrication by complete immersion in a zinc bath in one operation and all excess carefully removed. The finished surface shall be clean and uniform.

10 Roads and Footpaths.

10.1 Rolling of Surface Materials

The type and weight of the roller to be employed on each courses of surfacing shall be approved beforehand by the Engineer. Notwithstanding, the Engineer may call for a certified weigh bridge ticket in respect of any roller at any time.
Roller wheels shall always be clean and even. An adequate water tank shall be provided together with a fully operating roller sprinkler system. The roller shall be operated by a man fully trained and experienced in rolling technique.

If the total of surfacing to be compacted exceeds 3,330 sq.m. per day, the contractor shall provide a second roller. In confined areas where normal rolling is not possible, mechanical tamping will be permitted. The tampers must be employed systematically to give a smooth "as - rolled" finish. No traffic will be permitted to use a new carriageway at any stage of construction without the written permission of the Engineer.

Notwithstanding any conditions which the Engineer may stipulate at the time of giving his permission of the Engineer. Notwithstanding any condition the Engineer may stipulate at the time of giving his permission, the Contractor will be solely responsible for maintaining the new carriageway, keeping the surface clean and for making good at his own expense any damage or wear so caused.

10.2 Laying Kerbs, Channels and Edging Blocks

Kerbs, channels and edging blocks shall he bedded true to line and level in cement mortar in a concrete foundation class 15. They shall he haunched with concrete class 15/20. The foundation and haunch shall be laid before the approved sub-base is laid to the dimensions shown on the drawings.

10.3 Preparation of Footpath Formation.

After the excavated of filling has been completed as specified the footpath formation shall be regulated to an even and uniform surface, and compacted with a roller weighing not less than 2.5 tonnes. If any soft places develop in the formation during compaction they shall be excavated and backfilled with approved granular material, levelled and re-compacted.

10.4 Precast Concrete Paving

Precast concrete paving slabs shall be to SRN 859 and shall be jointed with 1:3 lime mortar. They shall be laid at a level not exceeding 4mm above the top of the kerb or concrete edging. The joints shall be thoroughly cleaned out and grouted with cement mortar well brushed in and flushed off. No cracked or broken slabs shall be used.

10.5 Chasing

Chasing in load - bearing walling for pipes, etc. is to be kept to a minimum size of cut and positions and runs of chases are to approved by the Engineer before any cutting is commenced.

10.6 Damp - Proof Courses (Dpc)

Damp - proof courses shall be 1000 gauge polythene free from tears and holes and be laid with 150mm minimum laps on and including a levelling screed of cement mortar.

10.7 Hacking Etc.

The prices for all paving and plastering, etc., shall include for hacking concrete surfaces and for raking out joints of walls 12mm deep and for cross scoring undercoats to form a proper

key.Plastering on walls generally shall be taken to include flush faces of lintels, beams, etc., in same.

10.6 Surfaces

All surfaces to be paved or plastered must be brushed clean and well wetted before each coat is applied. All cement paving and plaster shall be kept continually damp in the interval between application of coats and for seven days after the application of the final coat.

10.17 Prices for Paving

Prices for paving are to include for adequate covering and protection during the progress of the works to ensure that the floors are handled over in perfect condition on completion.

10.18 Polished Terrazzo

Polished terrazzo shall be laid by an approved sub-Contractor and shall consist of a screed or backing coat and a finishing coat of "snowcrete" and marble chippings (1:2) mixed with "cemantone No. 1" colouring compound in accordance with the manufacturer's instructions in the proportions of 1 kg. Compound to 10kg Cement. Overall thickness is to be as specified.

The finishing coat shall be a minimum of 12mm thick for paving trowelled to a smooth and even finish and well embbed and polished with carborundum.

SECTION VII- BILLS OF QUANTITIES

REHABILITATION WORKS FOR OLD TREATMENT PLANT AND CHANIA INTAKE

Tender no: THIWASCO/046/RWTP/2022-2023

GRAND SUMMARY

Bill no.	Bill Descprition	(Kshs.)
1	Preliminary and General Items	
2	Old Water Treatment Plant Improvement Works	
3	New Water Treatment Site	
4	Intake and Canal Works	
5	Electro-Mechanical Works	
6	Schedule of Dayworks	
7	Construction Supervision	
	Subtotal	
	Add 10% Contingency	
	GRAND TOTAL VAT INCLUSIVE	

BILL No. 1: PRELIMINARY AND GENERAL ITEMS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	CLASS A: GENERAL ITEMS				
	Contractual requirements				
A110	Performance security as per Clause 10.1 of Conditions of Contract	Sum			
A120.1	Insurance of the Works and Contractor Equipment as per Clause 21.1 of Conditions of Contract.	Sum			
A120.2	Insurance for Contractor Equipment as per Clause 21.1 of Conditions of Contract.	Sum			
A120.3	Third Party Insurance and Damage to Property as per Clause 23.2 of Conditions of Contract.	Sum			
	Specified requirements				
A211.1	Allow for establishment of Contractor's camp and its maintenance for the period of the Contract and removal at the end of the Contract	Sum			
A211.2	Provisional Sum of Kshs 200,000 for provision of Furniture and Equipment for the Resident Engineer's Office to specifications	PC Sum			200,000.00
A211.3	Add profit, administration, attendance upon, overheads, etc. for Item A211.1-2	%			-
	Provide Equipment for use by Engineer's Staff				
A221.1	Provisional sum of Kshs 200,000 for hire of one Double Cabin Vehicles (2500cc) for use by Engineer's Staff as instructed. Vehicles to revert to the Employer at the end of the Project	PC sum			200,000.00
A221.2	Add profit, administration, attendance upon, overheads, etc. for Item A221.1	%			
	Attendance upon the Engineer's Staff				
	Provide the following staff for the Resident Engineer's Office. (Note: The Staff to be employed by the Contractor but to be under the exclusive day to day instruction of the Resident Engineer)				
A231.1	Driver No.1	month	24		
A232.1	Surveying assisant 1 No	month	6		
A232.2	Chainmen, 2 No	month	6		
	Testing of Materials				
A240.1	Testing of materials ordered by project manager	P sum			100,000.00
A240.2	Inspection of pipe fittings manufacturing confirmation by the Employer and Engineer staff.	PC sum			1,000,000.00
A240.3	Add profit, administration, attendance upon, overheads, etc. for Item A240.1-.2 and item A240.1-.1	%			

PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	Temporary Works				
A300	Provide and maintain project publicity sign boards (location as directed on site)	nr	1		
	Other Provisional Sums				
A400.1	Allow a sum of Kshs 100,000 for the Engineer's miscellaneous accounts to be spent in whole or part as instructed by the Engineer and to be reimbursed against receipts	PC Sum	1		100,000.00
A400.2	Allow the Provisional Sum of KShs.100,000 to cover special supervision costs of experts	PC Sum			100,000.00
A400.3	Percentage adjustment to provisional sum in Items A400-1 to A400-2	%			
	Method Related Charges				
	Provisional Sums- Specific Conditions				
A500.1	Allow for excavation for and identification of extent/limits of existing pipelines including excavation, alignment, levels and other as-built details at interconnection points. Include for backfilling of excavated areas and production of ACAD drawings showing details of pipelines and other services . These Works to be carried out prior to commencement of works.	PC Sum			100,000.00
A500.2	Percentage adjustment to provisional sum in Items A500-1	%			
A500.3	Allow for any costs associated with relocation of existing services Liaison with the relevant Authorities shall be the responsibility of the Contractor for the timely execution of the Works.	PC Sum			100,000.00
A500.4	Percentage adjustment to provisional sum in Items A 500-3	%			
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	COLLECTION				
1	BROUGHT FORWARD FROM PAGE 1				-
2	BROUGHT FORWARD FROM PAGE 2				-
	BILL TOTAL TAKEN TO GRAND SUMMARY				**-**

BILL No. 2: LOT 1 WORKS
OLD WATER TREATMENT SITE

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	DEMOLITIONS AND RELOCATIONS				
	Site clearance of proposed Flocculation units construction site; structures and pipes to be demolished and removed to be identified by the Engineer: Rate to include for carting away all cleared material				
2.D1.1	General clearance	m^2	220		
2.D1.2	Relocation street lighting posts and cabling along the sedimentation basin walkway - No 10	nr	10		
2.D1.3	Demolition and reconstruction of existing Masonary Retaining wall and disposing off waste material- by about 2 m	m^3	150		
2.D1.4	Demolition and removal of all pipework as stated under Preliminary and General items; - Nominal dia. 100-300mm	m	230		
2.D1.5	Demolition Masonry Manholes, walkway slab and old Gate valve chambers	m^3	13		
2.D1.6	Relocation of all pipework found to be in use as observed under Preliminary and General items; Item A500 - Nominal dia. 100-300mm	sum			
	BILL No. 2.2: Flocculation Basin OLD UNIT				
2.2.1	**CLASS E: EARTHWORKS**				
	The rates shall include for all strutting, shuttering, stabilising the excavation faces and keeping the excavation free of water by pumping, bailing or other means				
2.2E.1	Excavate 200mm top soil and dispose	m^2	201		
	Excavated in material other than topsoil, rock or artificial hard material				
2.2E.2	Maximum depth 0.25- 0.5m	m^3	101		
2.2E.3	Maximum depth 0.5 m to 1.0 m	m^3	101		
2.2E.4	Maximum depth 1.0m - 2.0m	m^3	201		
2.2E.5	Maximum depth 2m - 3m	m^3	201		
2.2E.6	Maximum depth 3.0m to 4.0m	m^3	201		
2.2E.7	Maximum depth n.e 4.5m	m^3	101		
	Excavated in rock				
2.2E.8	Maximum depth 0.5m - 1m	m^3	101		
2.2E.9	Maximum depth 1m - 2m	m^3	201		
2.2E.10	Maximum depth 2.0m to 3.0m	m^3	40		
2.2E.11	Maximum depth 3.0m to 4.0m	m^3	40		
2.2E.12	Maximum depth n.e 4.5m	m^3	20		

	PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET				
	Excavation Ancillaries				
2.2E.13	Trim surfaces to receive blinding concrete	m^2	101		
	Filling				
2.2E.14	Provide approved hard-core and compact in layers of 200mm, blinded with final material 25mm thick in fill area only	m^3	23		
	CLASS F: INSITU CONCRETE:				
	Mass Concrete Class 15				
2.2F1.1	Plain concrete Class 15 in 75mm blinding layer under base slab of Strainer chamber and under bases of reinforced walls. to specifications BS 5328(1990), of max. 20mm Aggreagate	m^3	19		
	Placing of concrete				
	Vibrated, Reinforced Concrete Class 30 (20/30 with water proofing) cement 42.5 N/mm^2 and sulphate resistant.				
2.2F2.1	300mm thick Base Slab - flocculation basin to specifications BS 5328(1990), of max. 20mm Aggregate	m^3	83		
2.2F2.2	300mm thick Walls - internal and external including channels and walkways	m^3	175		
2.2F2.3	150mm thick Baffle walls 42 no. as shown in the drawings	m^3	52		
	CLASS G: CONCRETE ANCILLARIES				
	Formwork- Fair finish				
	Provide and fix shuttering including propping, strutting and striking all as specified				
	(i) Vertical formwork				
2.2G1.1	Sides of 300mm Base Slab	m^2	44		
	(i) Vertical formwork				
2.2G1.2	Sides of walls, height n.e. 4.5m - including channel and baffle walls	m^2	1406		
	(iii) Horizontal Formwork - Class F3 Finish				
2.2G1.3	Walkways soffit	m^2	164		
	Reinforcement				
	Provide and fix high tensile steel reinforcement to BS 4449 including cutting, bending, propping, with spacers and tying as specified in the drawings				
2.2G2.1	10 mm diameter	kg	14,601		
2.2G2.2	12 mm diameter	kg	21,902		
	Construction Joints				
	Provide and install the following waterstops in construction joints including all surface treatment, formwork, forming of rebate and sealing of rebate with polysulphide sealant all as per Drawings and Specification				

2.2G3.1	300 mm wide expansive super-cast water foil PVC or similar approved waterstop in construction joints in walls (Provisional)	m	180		
	CLASS I- PIPEWORK: PIPES				
	Provide and lay steel - DN 600 mm PN6 pipe, with push fit joints in standard lengths; Jointing shall be by butt welding as recommended in the specification and manufacturers				
2.2I.1	DN 600mm in trench , depth n.e 2.5m	m	12		
	BILL No. 2.3: SEDIMENTATION BASINS (6 No.)OLD UNIT				
	CLASS F: INSITU CONCRETE:				
	Mass Concrete Class 15				
2.3F.1	Plain concrete Class 15 in 100mm casing to metal frame support sections for the tube settlers fixed to existing hardened reinforced walls. With cross section area 0.03-0.25 m^2 to speciffications BS 5328(1990), of max. 10mm Aggregate	m^3	1.00		
	PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET				
	CLASS G: CONCRETE ANCILLARIES				
	Repairs to Spalling Concrete				
2.3G.1	Break up and remove all spalling concrete up to depth of 50mm the damaged perimeter of the area should be saw cut to a depth of 50mm and the edges cut as neatly as possible keeping the sides square for all columns, beams , walls and floor slabs , exposing all corroded rebar. Clean up surface rust and blisters from rebar, apply "Master Emaco S 488" strictly in accordance with manufacturer's specifications or a similar approved proprietary cement based prime . Dampen concrete surface and apply an approved proprietary concrete repair mortar, smoothly finished. Allow for necessay shuttering. **Rate is to include for necessary equipment and machinery for works to be carried out up to a level of 5 metres below ground level**	m^2	912		
	Plaster Repairs				
2.3G.2	All plaster repair mortar are to be applied strictly in accordance with the "Master Emaco S 488" or similar approved requirements. Break out all loose and hollow plaster at least 20 mm wide all around loose plaster area, brush clean of all loose material, treat exposed area with an approved adhesive slurry and finish off with a waterproof plaster mortar of 3 to 1 sand/cement	m^2	1824		
	Crack Repairs				
	Supplemantary preamble:- Walls				
2.3G.3	Repair crack in plastered walls by hacking off existing plaster to 20mm depth face perpendicular to the face of the wall, repair hole shall be conical in shape with the large end at the surface from which repair material will be placed and fill with 'Master Inject 1335 Chemicals' or similar approved crack repair product, the injection should be followed by injection of Master Inject 1320 to achieve a more durable seal and finish off with 3:1 cement plaster including making good	m	100		
	Repairs cracked plaster/ concrete surfaces as noted above:				
	Supplemantary preamble:- Concrete floors				

2.3G.4	Repair crack in concrete floors by hacking off the existing screed to expose the concrete surface, 20mm width on either side of the crack, the crack spacings shall not exceed 600mm centres and fill with 'MasterInject 1335 Chemicals' or similar approved 'wet to dry' epoxy to the crack ,Install injection fittings in accordance with manufacturer's instructions; allow fittings to remain in place until chemical grout injection work is complete in that area. Install caps or valves at injectiion ports to prevent back flow of uncured chemical grout after it has been injected and applying bonding liquid and finish off with 25Mpa cement plaster including making good.	m	200		
	CLASS I: PIPEWORK- PIPES				
2.3I.1	200 mm dia epoxy coated and lined steel pipe deliver to sedimentation clarifiers	m	30		
2.3I.2	100 mm dia epoxy coated and lined deliver steel pipe to sedimentation clarifiers	m	97		
2.3I.3	150 mm dia epoxy coated and lined steel sludge drain pipes	m	80		
	BILL No. 2.4 FILTERS (12 No.) OLD UNIT				
	CLASS G: CONCRETE ANCILLARIES				
	Repairs to Spalling Concrete				
2.4G.1	Break up and remove all spalling concrete up to depth of 50mm the damaged perimeter of the area should be saw cut to a depth of 50mm and the edges cut as neatly as possible keeping the sides square for all columns, beams , walls and floor slabs , exposing all corroded rebar. Clean up surface rust and blisters from rebar, apply "Master Emaco S 488" strictly in accordance with manufacturer's specifications or a similar approved proprietary cement based prime . Dampen concrete surface and apply an approved proprietary concrete repair mortar, smoothly finished. Allow for necessay shuttering. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level**	m^2	352		
	Plaster Repairs				
2.4G.2	All plaster repair mortar are to be applied strictly in accordance with the "Master Emaco S 488" or similar approved requirements. Break out all loose and hollow plaster at least 20 mm wide all around loose plaster area, brush clean of all loose material, treat exposed area with an approved adhesive slurry and finish off with a waterproof plaster mortar of 3 to 1 sand/cement	m^2	704		
	PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET				
	Crack Repairs				
	Supplemantary preamble:- Walls				
2.4G.3	Repair crack in plastered walls by hacking off existing plaster to 20mm depth face perpendicular to the face of the wall, repair hole shall be conical in shape with the large end at the surface from which repair material will be placed and fill with 'MasterInject 1335 Chemicals' or similar approved crack repair product, the injection should be followed by by injection of MasterInject 1320 to achieve a more durable seal and finish off with 3:1 cement plaster including making good. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level**	m	100		
	Repairs cracked plaster/ concrete surfaces as noted above:				
	Supplemantary preamble:- Concrete floors				

2.4G.4	Repair crack in concrete floors by hacking off the existing screed to expose the concrete surface, 20mm width on either side of the crack, the crack spacings shall not exceed 600mm centres and fill with 'MasterInject 1335 Chemicals' or similar approved 'wet to dry' epoxy to the crack ,Install injection fittings in accordance with manufacturer's instructions; allow fittings to remain in place until chemical grout injection work is complete in that area. Install caps or valves at injectiion ports to prevent back flow of uncured chemical grout after it has been injected and applying bonding liquid and finish off with 25Mpa cement plaster including making good. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level**	m	200		
	CLASS E: EARTHWORKS				
	Excavation Ancillaries				
	Filter Media				
	Fine sand				
2.4E.1	Provide filter bed 0.7m to form filter sand bed with an effective size of 0.5–1.0mm gravel and form filters bed and a uniformity coefficient not exceeding 1.5.	m^3	170		
	Gravel				
2.4E.2	Provide filter bed 0.6 m thick having 4 gravel layers from top to bottom: Provide layers as: 15cm 2 - 2.8 mm 10cm 5.6 - 8.0mm 10cm 16 - 23mm 20cm 38 - 54mm	m^3	145		
	CLASS U: BLOCKWORK, BRICKWORK AND MASONRY				
	Underdrain				
2.4U.1	Provide a Provisional Sum PC of KShs 6,000,000.00 for concrete repairs for existing underdrainage system.	PC sum			6,000,000.00
2.4U.2	Overhead and profit	%			
	CLASS V: PAINTING				
	Prepare and Apply Three Coats epoxy Paint Internal faces of :-				
2.4V.1	Fair-faced concrete surfaces, concrete surfaces filter gallery etc	m^2	1,230		
	CLASS Z: OTHER BUILDING WORKS				
	Windows and Doors Casement repairs				
2.4Z.1	Provide a Provisional sum PC of Kshs. 200,000 for the works under Repair , change any broken glass and fittings , seal for all damaged windows (1000 mm X 1200mm) and double swing glazed doors(1500mm X 2100mm) to Engineers approval for the filter gallery	PC sum			200,000.00
	BILL No. 2.8 : CLEAR WATER PIPEWORK IMPROVEMENTS				
	CLEAR WATER PIPE WORK				
	CLASS D: DEMOLITIONS AND SITE CLEARANCE				
	Site clearance of clear water pipeline works site, trees to be cleared to be identified by the Engineer: Rate to include for carting away cand disposing cleared				
2.8D100.1	General Site clearance	m^2	360		
	DEMOLITIONS AND RELOCATIONS				
2.8D521.1	Demolition and removal of old pipes ; Nominal bore 300-500mm	m	260		
2.8D521.2	Demolition of Masonry Manholes and Gate valve chambers; volume n.e 50m^3	m^3	50		

2.8D521 .3	Relocation and replacement of pipes - Provide the Provisional Sum of KShs 500,000 Five Hundred Thousand Only)	PC sum			500,000.00
2.8D521 .4	Contractor's profits and over heads for items 2.42.1 and item2.8DS21.3	%			
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	CLASS E: EARTHWORKS				
	Excavation				
	The rates shall include for all strutting, shuttering, stabilising the excavation faces, and keeping the excavation free of water by pumping, bailing or other means				
2.8E412	Excavate 200mm top soil and dispose	m^2	360		
2.8E413	Transport approved excavated material from site and use as fill and compact in 200mm layers as specified on site as and when directed by the Engineer. Compaction tests to be done and rates to include for this	m^3	72		
	CLASS I- PIPEWORK: PIPES				
2.8I730	Supply, lay and Join 800mm dia steel pipe corrosion protected by fusion bonded Epoxy both internally and externally ; all accessories for complete installation of the lines and fittings. Jointing shall be by bolted flanges and spigot/sockets.	m	180		
	Excavations				
	Excavation and backfilling of trenches. Include for preparation of trench surfaces; upholding sides of the excavation, disposal of excess excavated material, removal of dead services except to the extent that such work is included in classes J, K and L. for pipe size OD 800 mm shall be jointed as in specification chapter 7.1 - 7.7				
2.8I731	Excavation for Trench Maximum depth not exc. 1.5	m	180		
2.8I732	Ditto- but maximum depth 1.5m to 2.0 m	m	180		
2.8I733	Excavation for Trench Maximum depth n.e. 2.0m	m	50		
	PIPE LAYING				
	Pipe laying in trench should be laid on an even and firmly compacted graded gravel bed as per specifications clause 7.5.1 . and on the ground surface, price includes works of classes J, K and L. for pipe size OD 800 mm shall be jointed; as well as backfilling and compacting as in the specifications				
2.8I734	Laying of pipes DN 800 mm in trench not exceeding 2.0m	m	180		
	CLASS L- PIPEWORK: ANCILLARIES TO LAYING AND EXCAVATION				
2.8L111	Extra to excavation and backfilling in rock blasting not permitted (Provisional)	m^3	3		
2..8L11 2	Extra to excavation and backfilling in Reinforced concrete manholes and other chambers (Provisional)	m^3	3		
2.8L113	Preparing of pipe beds in sand	m	180		
	CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES				
	Chambers				
2.8K113	Provide materials and construct in situ concrete valve chambers, depth not exceeding 2.5m	nr	8		
	CLASS L: PIPEWORK - SUPPORTS AND PROTECTION				
2.8L540	Class 20 mass concrete in pipe surrounds and tee thrust blocks for DN 800 mm pipe , Volume 0.5-1m^3	nr	8		

	Other Provisional Sums				
2.8A420 .5	**Allow for all cost to provide clean water tank level indicator complete with cables to full, 50% full and empty monitored in the pump house and control room**	L.sum	4.0		-
	-				
PAGE TOTAL CARRIED TO SECTION COLLECTION PAGE					
	COLLECTION				
1	BROUGHT FORWARD FROM PAGE 1				
2	BROUGHT FORWARD FROM PAGE 2				
3	BROUGHT FORWARD FROM PAGE 3				
4	BROUGHT FORWARD FROM PAGE 4				
5	BROUGHT FORWARD FROM PAGE 5				
BILL TOTAL TAKEN TO GRAND SUMMARY					

	REHABILITATION WORKS FOR OLD TREATMENT PLANT AND CHANIA INTAKE **Tender: no: THIWASCO/046/RWTP/2022-2023**				
	BILL No. 3: LOT 2 WORKS				
	NEW WATER TREATMENT SITE				
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**
No.				**(Kshs)**	**(Kshs)**
	DEMOLITIONS AND RELOCATIONS				
	Site clearance of proposed Flocculation units construction site; structures and pipes to be demolished and removed to be identified by the Engineer: Rate to include for carting away all cleared material				
3.1D.1	General clearance	m^2	356		
3.1D.2	Relocation of powerline, lighting posts along the sedimentation basin walkway - No 8	nr	8		
3.1D.3	Demolition and removal of all pipework as stated under Preliminary and General items; Item A7 - Nominal dia. 100-300mm	m	200		
3.1D.4	Demolition of Masonry Manholes, walkway slab and old Gate valve chambers ; volume n.e $10m^3$	Item			-
3.1D.5	Relocation all pipework found to be in use as observed under Preliminary and General items; Item A7 - Nominal dia. 100-300mm	sum			
	BILL No. 3.2: FLOCCULATION UNITS				
	CLASS: A- GENERAL ITEMS				
	Specified requirements ;-Testing of Works				
3.2A.1	Allow for leak proof testing of Flocculation Basin & flocculated water channel as per in the specification	Item	L.S		
	CLASS E: EARTHWORKS				
	The rates shall include for all strutting, shuttering, stabilising the excavation faces and keeping the excavation free of water by pumping, bailing or other means				
3.2E.1	Excavate 200mm top soil and dispose	m^2	172		
	Excavated in material other than topsoil, rock or artificial hard material				
3.2E.2	Maximum depth 0.25- 0.5m	m^3	86		
3.2E.3	Maximum depth 0.5 m to 1.0 m	m^3	172		
3.2E.4	Maximum depth 1.0m to 2.0m	m^3	172		
3.2E.5	Maximum depth 2.0m to 3.0m	m^3	172		
3.2E.6	Maximum depth 3.0m to 4.0m	m^3	172		
3.2E.7	Maximum depth n.e 4.5m	m^3	86		
	Excavated in rock				
3.2E.8	Maximum depth 0.5m - 1m	m^3	172		
2.2E.9	Maximum depth 1.0m to 2.0m	m^3	172		
3.2E.10	Maximum depth 2.0m to 3.0m	m3	34		
3.2E.11	Maximum depth 3.0m to 4.0m	m^3	34		
3.2E.12	Maximum depth n.e 4.5m	m^3	17		
	Excavation Ancillaries				
3.2E.13	Trim surfaces to receive blinding concrete	m^2	86		
	Filling				

3.2E.14	Transport approved excavated material from site and use as fill and compact in 200mm layers as specified as a directed by the Engineer. Compaction tests to be done and rates to include for this	m^3	34		
3.2E.15	Provide approved hard-core and compact in layers of 200mm, blinded with fine material 25mm thick in fill area only	m^3	19		
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	CLASS F: INSITU CONCRETE:				
	Mass Concrete Class 15				
3.2F.1	Plain concrete Class 15 in 75mm blinding layer under base slab of Strainer chamber and under bases of reinforced walls. to BS 5328(1990), of max. 20mm Aggreagate	m^3	12		
	Placing of concrete				
	Vibrated, Reinforced Concrete Class 30				
3.2F.2	300mm thick Base Slab - flocculation basin to BS 5328(1990), of max. 20mm Aggreagate	m^3	65		
3.2F.3	300mm thick Walls - internal and external including channels and walkways	m^3	133		
3.2F.4	150mm thick Baffle walls 35 no. as shown in the drawings	m^3	32		
	CLASS G: CONCRETE ANCILLARIES				
	Formwork- Fair finish				
	Provide and fix shuttering including propping, strutting and striking all as specified				
	(i) Vertical formwork				
3.2G.1	Sides of 300mm Base Slab	m^2	36		
	(i) Vertical formwork				
3.2G.2	Sides of walls, height n.e. 2.6m - including channel and baffle walls	m^2	1297		
	(iii) Horizontal Formwork - Class F3 Finish				
3.2G.3	Walkways soffit	m^2	164		
	Reinforcement				
	Provide and fix high tensile steel reinforcement to BS 4449 including cutting, bending, propping, with spacers and tying as specified in the drawings				
3.2G.4	10 mm diameter	kg	16,250		
3.2G.5	12 mm diameter	kg	10,833		
	Construction Joints				
	Provide and install the following waterstops in construction joints including all surface treatment, formwork, forming of rebate and sealing of rebate with polysulphide sealant all as per Drawings and Specification				
3.2G.6	300 mm wide expansive super-cast water foil PVC or similar approved waterstop in construction joints in walls (Provisional)	m	150		
BILL No. 3.3: SEDIMENTATION BASINS (6 No.) NEW UNIT					
	CLASS: A- GENERAL ITEMS				
	Specified requirements: Testing of Works				
3.3A.1	Allow for leak proof testing of inlet channel to sedimentation(6 inlet chambers) as per in the specification	Item	L.S		
	CLASS F: INSITU CONCRETE:				
	Mass Concrete Class 15				
3.3F.1	Plain concrete Class 15 in 100mm to casing of metal frame support sections for the tube settlers fixed to existing hardened reinforced walls. With cross section area 0.03-0.25 m^2 to BS 5328(1990), of max. 10mm Aggreagate	m^3	1.00		

	CLASS G: CONCRETE ANCILLARIES				
	Repairs to Spalling Concrete				
3.3G.1	Break up and remove all spalling concrete up to depth of 50mm the damaged perimeter of the area should be saw cut to a depth of 50mm and the edges cut as neatly as possible keeping the sides square for all columns, beams , walls and floor slabs , exposing all corroded rebar. Clean up surface rust and blisters from rebar, apply "Master Emaco S 488" strictly in accordance with manufacturer's specifications or a similar approved proprietary cement based prime . Dampen concrete surface and apply an approved proprietary concrete repair mortar, smoothly finished. Allow for necessay shuttering. ***Rate is to include for necessary equipment and machinery for works to be carried out up to a level of 5 metres below ground level***	m^2	912		
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	Plaster Repairs				
3.3G.2	All plaster repair mortar are to be applied strictly in accordance with the "Master Emaco S 488" or similar approved requirements. Break out all loose and hollow plaster at least 20 mm wide all around loose plaster area, brush clean of all loose material, treat exposed area with an approved adhesive slurry and finish off with a waterproof plaster mortar of 3 to 1 sand/cement	m^2	1824		
	Crack Repairs				
	Supplemantary preamble:- Walls				
3.3G.3	Repair crack in plastered walls by hacking off existing plaster to 20mm depth face perpendicular to the face of the wall, repair hole shall be conical in shape with the large end at the surface from which repair material will be placed and fill with 'MasterInject 1335 Chemicals' or similar approved crack repair product, the injection should be followed by by injection of MasterInject 1320 to achieve a more durable seal and finish off with 3:1 cement plaster including making good	m	100		
	Repairs cracked plaster/ concrete surfaces as noted above:				
	Supplementary preamble:- Concrete floors				
3.3G.4	Repair crack in concrete floors by hacking off the existing screed to expose the concrete surface, 20mm width on either side of the crack, the crack spacings shall not exceed 600mm centres and fill with 'Master Inject 1335 Chemicals' or similar approved 'wet to dry' epoxy to the crack ,Install injection fittings in accordance with manufacturer's instructions; allow fittings to remain in place until chemical grout injection work is complete in that area. Install caps or valves at injectiion ports to prevent back flow of uncured chemical grout after it has been injected and applying bonding liquid and finish off with 25Mpa cement plaster including making good.	m	200		
	CLASS I: PIPEWORK- PIPES				
3.3I.1	250 mm dia Epoxy coated and lined steel delivery pipe to sedimentation clarifiers	m	60		
3.3I.2	150 mm dia Epoxy coated and lined steel sludge drain pipes	m	50		
	BILL No. 3.4 FILTERS (12 No.) NEW UNIT				
	CLASS G: CONCRETE ANCILLARIES				
	Repairs to Spalling Concrete				
3.4G.1	Break up and remove all spalling concrete up to depth of 50mm the damaged perimeter of the area should be saw cut to a depth of 50mm and the edges cut as neatly as possible keeping the sides square for all columns, beams , walls and floor slabs , exposing all corroded rebar. Clean up surface rust and blisters from rebar, apply "Master Emaco S 488" strictly in accordance with manufacturer's specifications or a similar approved proprietary cement based prime . Dampen concrete surface and apply an approved proprietary concrete repair mortar, smoothly finished. Allow for necessay shuttering. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level.**	m^2	352		
	Plaster Repairs				

3.4G.2	All plaster repair mortar are to be applied strictly in accordance with the "Master Emaco S 488" or similar approved requirements. Break out all loose and hollow plaster at least 20 mm wide all around loose plaster area, brush clean of all loose material, treat exposed area with an approved adhesive slurry and finish off with a waterproof plaster mortar of 3 to 1 sand/cement.	m^2	704		
	Crack Repairs				
	Supplemantary preamble:- Walls				
3.4G.3	Repair crack in plastered walls by hacking off existing plaster to 20mm depth face perpendicular to the face of the wall, repair hole shall be conical in shape with the large end at the surface from which repair material will be placed and fill with 'MasterInject 1335 Chemicals' or similar approved crack repair product, the injection should be followed by by injection of MasterInject 1320 to achieve a more durable seal and finish off with 3:1 cement plaster including making good. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level**	m	100		
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	Repairs cracked plaster/ concrete surfaces as noted above:				
	Supplementary preamble:- Concrete floors				
3.4G.4	Repair cracks in concrete floors by hacking off the existing screed to expose the concrete surface, 20mm width on either side of the crack, the crack spacings shall not exceed 600mm centres and fill with 'MasterInject 1335 Chemicals' or similar approved 'wet to dry' epoxy to the crack ,Install injection fittings in accordance with manufacturer's instructions; allow fittings to remain in place until chemical grout injection work is complete in that area. Install caps or valves at injectiion ports to prevent back flow of uncured chemical grout after it has been injected and applying bonding liquid and finish off with 25Mpa cement plaster including making good. **Rate is to include for necessary equipment and machinery and contractors overhead and markup for works to be carried out up to a level of 5 metres below ground level**	m	200		
	CLASS E: EARTHWORKS				
	Excavation Ancillaries				
	Filter Media				
	Fine sand				
3.4E.1	Provide filter bed 0.7m to form filter sand bed with an effective size of 0.5 – 1.0mm gravel and form filters bed and a uniformity coefficient not exceeding 1.5.	m^3	170		
	Gravel				
3.4E.2	Provide filter bed 0.6 m thick having 4 gravel layers from top to bottom: Provide layers as: 15cm 2 - 2.8 mm 10cm 5.6 - 8.0mm 10cm 16 - 23mm 20cm 38 - 54mm	m^3	145		
	CLASS U: BLOCKWORK, BRICKWORK AND MASONRY				
	Underdrain				
3.4U.1	Provide a Provisional Sum PC of KShs 6,000,000.00 for concrete repairs for underdrainage system	PC sum			6,000,000.00
3.4U.2	Contractor's profit and overhead	%			
	CLASS V: PAINTING				
	Prepare and Apply Three Coats Epoxy Paint on Internal Faces:-				
3.4V.1	Fair-faced concrete surfaces, concrete surfaces filter gallery etc	m^2	1,230		
	Metal Work Painting				
	Provide, prepare and apply painted with one coat of red oxide and two coats of aluminium paint				
3.4V.2	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	216		
	CLASS Z: OTHER BUILDING WORKS				

	-				
	Windows and Doors Casement repairs				
3.4Z.1	Provide a Provisional sum PC of Kshs. 200,000 for the works under Repair , change any broken glass and fittings , seal for all damaged windows (1000 mm X 1200mm) and double swing glazed doors(1500mm X 2100mm) to Engineer's approval for the filter gallery	sum			
PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET					
	COLLECTION				
1	BROUGHT FORWARD FROM PAGE 1				
2	BROUGHT FORWARD FROM PAGE 2				
3	BROUGHT FORWARD FROM PAGE 3				
4	BROUGHT FORWARD FROM PAGE 4				

	UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT PHASE 2 (THIWASCO/046/UTPRP/2022-2023)				
	BILL No. 4.0 : LOT 3 WORKS				
	Provide and place concrete, vibrate, compact and cure concrete in the following 'elements of the structure as per details on drawings				
	Intake Canal Lining				
4.1F511	Shotcrete to stabilise canal excavation surface beneath lining in rock or as directed - thickness: 25 mm	m^2	120		
	Mass Concrete Class 15				
4.1F521	Plain concrete Class 15 in 75mm blinding layer under canal and wing wall foundation to speciffications BS 5328(1990), of max. 20mm Aggreagate	m^3	12		
	Vibrated, Reinforced Concrete Class 25				

4.1F622.1	200mm thick Reinforced concrete; class 25; wing wall	m^3	31		
4.1F622.2	150mm thick Reinforced concrete; class 25; canal walls	m^3	69		
	CLASS G: CONCRETE ANCILLARIES				
	-				
	Formwork-Fair finish				
	Provide and fix shuttering including propping, strutting and striking all as specified				
	(i) Vertical width not exceeding 0.1m				
4.1G241.1	Sides of 200mm Base Slab; wing wall	m^2	3		
4.1G241.2	Sides of 150mm Base Slab; canal	m^2	25		
	Page Total Carried Forward to Collection				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	(ii) Vertical Formwork - width 0.1 - 0.2m				
4.1G283.1	Sides of walls, height n.e. 4.0m - wing wall and intake chamber walls	m^2	239		
4.1G283.2	Sides of walls, height n.e. 2.0m ; canal walls	m^2	670		
	(iii) Horizontal Formwork - Class F3 Finish				

4.1G384.1	Walkways and operating platform soffits (**Wing wall**)	m^2	22		
4.1G384.2	Walkways and operating platform soffits (**WEIR**)	m^2	6		
	-				
	Reinforcement				
	Provide and fix high tensile steel reinforcement to BS 4449 including cutting, bending, propping, with spacers and tying as specified in the drawings				
4.1G523	10 mm diameter	kg	11770		
4.1G524	12 mm diameter	kg	7850		
	Construction Joints				
	Provide and install the following waterstops in construction joints including all surface treatment, formwork, forming of rebate and sealing of rebate with polysulphide sealant all as per Specification				
4.1G652	200 mm wide expansive super-cast water foil PVC or similar approved waterstop in construction joints in walls	m	140		
	CLASS H: PRECAST CONCRETE				
4.1H51	Precast Concrete covers 0.2m, by 1.5m by 150mm thick slabs including necessary reinforcement	No	400		
	CLASS M : STRUCTURAL METALWORK				
	ANCHORAGE ROCK ASSEMBLIES				

4.1M480	Fix dowel bars or equivalent completely installed including drilling, flushing of hole, placing of bolts and grouting - bar type: GEWI; diameter: 25mm; steel grade: 500/550 N/mm2; direction: all - length: 2 m at 0.5m c/c.	nr	22		
	CLASS N: MISCELLANEOUS METAL WORK				
4.1N999.1	Supply and install flashing gates to AWWC501-92 to fit 1.0m by 1.0m complete with its frame and manual operating hand wheel	nr	1		
4.1N999.2	Supply and install a 3.90m by 3.20m Avio gate fitted at the intake orifice, the Costs include clamping and anchoring, materials & equipment, shipping charges, and installation	nr	1		
4.1N999.3	Stainless steel cat ladder for access to the flush gates not exceeding 3m high	nr	2		
Total Page Carried to Collection inclusive of all taxes					
	BILL No. 4.2 :SETTLING BASIN AND FOREBAY				
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
	SETTLING BASIN AND FOREBAY				

	CLASS D: DEMOLITIONS AND SITE CLEARANCE				
	Site clearance for settling basin site, trees to be cleared to be identified by the Engineer: Rate to include for carting away cand disposing cleared				
	-				
4.2D100.1	General Site clearance	m^3	539		
4.2D210.1	Girth 0.5m - 1.0m	nr	3		
	Stumps				
4.2D310.1	Diameter 150-500 mm	nr.	6		
4.2D310.2	Diameter 500 mm - 1m	nr.	3		
4.2D310.3	Diameter exceeding 1m	nr.	3		
	CLASS E: EARTHWORKS				
	Excavation shall include for strutting, timbering, stabilising excavated surfaces and dewatering. It shall also include trimming and compaction of the excavated surfaces as required.				
4.2E412	Excavation for top soil to depths not exceeding 300mm	m^3	162		
	Excavated in material other than topsoil, rock or artificial hard material				
4.2E321	Maximum depth n.e. 0.25m	m^3	135		
4.2E322	Maximum depth 0.25m - 0.5m	m^3	135		
4.2E323	Maximum depth 0.5m - 1m	m^3	270		
4.2E324	Maximum depth 1m - 2m	m^3	270		

	Excavated in rock				
4.2E331	Maximum depth n.e. 0.25m	m^3	162		
4.2E332	Maximum depth 0.25m - 0.5m	m^3	162		
4.2E333	Maximum depth 0.5m - 1m	m^3	270		
4.2E334	Maximum depth 1m - 2m	m^3	270		
4.2E335.1	Maximum depth 2m - 3m	m^3	270		
4.2E335.2	Maximum depth 3m - 4m	m^3	225		
4.2E335.3	Maximum depth 4m - 5m	m^3	225		
4.2E336	Maximum depth 5m - 6m	m^3	225		
	Excavation ancillaries				
4.2E512	Preparation of excavated surfaces to receive blinding concrete	m^3	539		
	Disposal of excavated materials. Approved material shall be retained for backfilling and unsuitable material shall be disposed to tip as directed by the Engineer.				
4.2E531	Disposal of topsoil off the site	m^3	162		
4.2E532	Disposal of material other than top soil, rock or other hard artificial material	m^3	810		
4.2E533	Disposal of excavated in rock	m^3	1808.4		
Total Page Carried to Collection					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
	Filling				

4.2E634.1	Replacement of unsuitable material beyond excavation profile by approved fill	m^3	452		
4.2E634.2	Replacement of unstable material beyond excavation profile in lined canal by soil-cement fill	m^3	362		
4.2E638	Backfill with selected fill material	m^3	121		
	CLASS F: INSITU CONCRETE:				
	Provide, place, vibrate, compact and cure concrete in the following 'elements of the structure as per details on drawings				
	Settling basin -base Lining				
4.2F521	Shotcrete to stabilise basin excavation surface beneath lining in rock or as directed - thickness: 25mm	m^2	614		
	Mass Concrete Class 15				
4.2F511	Plain concrete Class 15 in 75mm blinding layer undersettling basin foundation to speciffications BS 5328(1990), of max. 20mm Aggreagate	m^3	46		
	Reinforced Concrete Class 25				
4.2F622.1	300mm thick base Reinforced concrete; class 25	m^3	184		
4.2F622.2	300mm thick Reinforced concrete walls ; class 25	m^3	259		
	CLASS G: CONCRETE ANCILLARIES				
	Formwork-Fair finish				

	Provide and fix shuttering including propping, strutting and striking all as specified				
	(i) Vertical on concrete slabs				
4.2G241.1	Sides of 300mm Base Slab	m^2	46		
	(ii) Vertical Formwork to walls				
4.2G241.2	Sides of walls, height n.e. 5.5m - including channel and walls	m^2	5,174		
	(iii) Horizontal Formwork - Class F3 Finish				
4.2G384.1	Walkways and Operating platform soffit	m^2	139		
	Reinforcement				
	Provide and fix high tensile steel reinforcement to BS 4449 including cutting, bending, propping, with spacers and tying as specified in the drawings				
4.1G523	10 mm diameter	kg	43,630		
4.1G524	12 mm diameter	kg	18,700		
	Construction Joints				
	Provide and install the following waterstops in construction joints including all surface treatment, formwork, forming of rebate and sealing of rebate with polysulphide sealant all as per Drawings and Specification				
4.1G652	300 mm wide expansive super-cast water foil PVC or similar approved waterstop in construction joints in walls	m	180		
	CLASS J: PIPEWORK- FITTINGS				
	Tube settlers Modules				

4.2J481	Suppy,assemble and fix the Tube settlers modules (560) IFR6024 - 24"(610mm) high x 12"(305mm) wide x 120"(3048mm) as shown in drawingsSRC/W/01-02 ,and with manufactures specifications clause 6.1.5	m^2	448		
Total Page Carried to Collection					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
	CLASS M: STRUCTURAL METALWORK				
	Support system for tube settlers frame-stainless steel Grade 316				
	Frabrication of members for frames staight on plan				
M351	Provide and fix continous stainless steel G 316 hollow section bars to specifications as shown in the drawings ; 250 x 250x 3mm thick square sections ;including cutting,weilding and concrete finshing at the wall joints; as shown in drawings SRC/W/01-08	m	200		
	CLASS N: MISCELLANEOUS METAL WORK				
4.2N999.1	Supply and fix stainless steel coarse screen, size 2000x1500mm, fabricated using stainless steel bars, dia 10 mm at spacing 50 mm and at vertical angle 90 degrees. Include for provision and fixing of frame into concrete walls. All as per details on drawings SRC/W/01-09	nr	1		
4.2N999.2	Supply and install two penstocks to Bs 7775:2005 to fit 1.0m by 1.0m at inlet of	nr	2		

	the settling basin complete with its frame and manual operating hand wheel				
4.2N999.3	Supply and install two penstocks to Bs 7775:2005 to fit 0.3m by 0.3m outlet flushing gates complete with its frame and manual operating wheel	nr	2		
4.2N999.4	Supply and install penstocks to Bs 7775:2005 to fit , 1.0m by 1.0m at the outlet to the forebay complete with its frame and manual operating hand wheel	nr	2		
4.2N999.5	Stainless steel cat ladder to access to the flush gates not exceeding 3m high ,including cutting,weilding and concrete finshing at the wall joints	nr	2		
4.2N999.6	Supply and install new lockable galvanized mild steel sheet metal cover over access manholes to Intake Chamber, size 600mm x 600mm to details and as shown on drawings	Nr	6		
4.2N999.7	Supply and install new stainless steel Step Irons on walls of fore-bay Chamber.	Nr	2		
4.2N999.8	Supply and fix stainless steel fine screen, size 3700mm x 1500mm, fabricated using stainless steel bars, dia 12mm at spacing 50mm,	Nr	3		
4.2N999.9	Supply and fix galvanized mild steel open grating cover over access to forebay Chamber, size 1500mm x 500mm to match the existing plates	Nr	3		
4.2N999.10	Provide and fix 40 mm diameter tubing Class B throughout of handrail and parallel middle rail 450 mm below the hand rail with balusters at maximum 1500 mm centres all as detailed	m	165		

	Total Page Carried to Collection				
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**
No.				**(Kshs)**	**(Kshs)**
	COLLECTION				
1	BROUGHT FORWARD FROM PAGE 1				
2	BROUGHT FORWARD FROM PAGE 2				
3	BROUGHT FORWARD FROM PAGE 3				
4	BROUGHT FORWARD FROM PAGE 4				
5	BROUGHT FORWARD FROM PAGE 5				
6	BROUGHT FORWARD FROM PAGE 6				
7	BROUGHT FORWARD FROM PAGE 7				
	BILL TOTALTAKEN TO COLLECTION VAT INCLUSIVE				

	BILL No. 5: ELECTRO-MECHANICAL WORKS				
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
5.1	**Electromechanical works in Flocculation Basin OLD UNIT**				
	CLASS I and J- PIPEWORK: PIPE FITTINGS AND VALVES				
5.1J.1	Supply and fix a new 600mm diameter Gate valve	nr	1		
	CLASS N: MISCELLANEOUS METAL WORK				
	All steelwork to be completely cleaned by acid dipping prior to galvanising				
5.1N.1	40mm Galvanised mild steel tubular balustrades guardrails all framed and welded together, including all necessary labours and fittings on tubing:as shown in the drawings SRC/W/02-01-01	m	110		
	CLASS V: PAINTING				
	Provide, prepare and apply one coat mordant solution, one undercoat and two coats gloss enamel paint on galvanised metal work externally on:				
5.1V.1	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	100		
	CLASS Z: OTHER BUILDING WORKS INCIDENTAL TO CIVIL ENGINEERING WORKS				

5.1Z.1	Provide and installation all electrical fittings for street lighting from the chemical house and sedimentation basin area as directed by the Engineer. Include for complete wiring, installation of power sockets and connection to existing grid as directed by the Engineer.	nr	10		
5.2	**Electromechanical works in SEDIMENTATION BASINS (6 No.)OLD UNIT**				
	CLASS J: PIPEWORK- FITTINGS AND VALVES				
	Bends - Long Radius (Epoxy Coated and Lined Steel)				
5.2J.1	DN 200, 90 ^{0}	nr	6		
	Junctions and Branches - fabricated cross				
5.2J.2	DN 300 x 100 epoxy coated	nr	6		
	Tube settlers Modules				
5.2J.3	Suppy,assemble and fix the Tube settlers modules (560) IFR6024 - or EQUIVALENT ;24" (610mm) high x 12" (305mm) wide x 120" (3048mm) as shown in drawings SRC/W/03-01 to 03-03 ,and to manufacturer's specifications	m^2	501		
	CLASS M: STRUCTURAL METALWORK				
	Support system for tube settlers frame- stainless steel Grade 316				
	Fabrication of members for frames straight on plan				

5.2M.1	Provide and fix continous stainless steel G 316 hollow section bars to specifications as shown in the drawings ; 75 x 75x 5mm thick angle sections ;including cutting,weilding and concrete finshing at the wall joints see drawing SRC/W/02-04	m	475		
	CLASS N: MISCELLANEOUS METAL WORK				
	Trough and Outflow channel				
5.2N.1	5 mm thick, 9.14 m long 400x300 mm Stainless Steel G316 settled water V-notch weir decanting trough	nr	36		
5.2N.2	Supply and Install epoxy coated Cone dispersion baffle units as detailed in the drawings	nr	24		
	CLASS V: PAINTING				
	Provide, prepare and apply painted with one coat of red oxide and two coats of aluminium paint				
5.2V.1	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	100		
	Page Total Carried Forward to Collection				
ITEM	**DESCRIPTION**				
		UNIT	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
5.30	**ELECTROMECHANICAL WORKS FOR FILTERS (12 No.) OLD UNIT**				
	CLASS J: PIPEWORK- FITTINGS AND VALVES				
5.3J.1	A Provisional sum PC of Kshs. 500,000 for the works under Repair , change any broken pipe and fittings , seal for all damaged joints for pipework in the filter gallery to the Engineers approval.	Pc Sum			500,000.00

5.3J.2	Overhead and profit	%			
5.3J.3	Supply and Install filter nozzles devices.	nr	4500		
	Metal Work Painting				
	Provide, prepare and apply painted with one coat of red oxide and two coats of aluminium paint				
5.3V.2	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	216		
5.4	**BILL No. 5.4 EQUIPMENT OLD UNIT**				
	Supply, install, test and commission in accordance to BS 7671:2008, the following as described below:				
5.4.1	**SLUDGE PUMPS**				
5.4.1.1	Open impeller pumps with a V gauge of 30mm for a duty of H=10m, Q=50m^3/hr complete with not less than 30m cabling and switch system	nr	24		
5.4.2	**AUTOMATIC FLOW REGULATION UNITS**				
5.4.2.1	Supply and Install level indicator system for the filters to indicate backwashing level complete with all not less than cabling to be monitored and the operation office.	nr	12		
5.5	**ELECTROMECHANICAL WORKS IN CLEAR WATER PIPEWORK IMPROVEMENTS WORKS**				
	CLASS J: PIPEWORK- FITTINGS AND VALVES				
	Straight Specials				
	Junctions and Branches				
5.5J342.1	DN 800 x 800 all flange tee	nr	1		
5.5J342.2	DN 800 x 600 all flange tee	nr	2		

5.5J342.3	DN 800 x 400 all flange tee	nr	2		
5.5J342.4	DN 800 x 300 all flange tee	nr	4		
	Bellmouths				
5.5J373.1	DN 600 flanged bellmouth with paddle flange	nr	2		
5.5J373.2	DN 400 flanged bellmouth with paddle flange	nr	2		
5.5J373.3	DN 300 flanged bellmouth with paddle flange	nr	4		
	Flange Adaptors				
5.5J353.1	DN 800	nr	16		
5.5J353.2	DN 600	nr	2		
5.5J353.3	DN 400	nr	2		
5.5J353.4	DN 300	nr	4		
	Flanged spigot pipe				
5.5J383.1	DN 800mm , length 600mm	nr	1		
5.5J383.2	DN 600mm , length 600mm	nr	2		
5.5J383.3	DN 400mm , length 900mm	nr	2		
5.5J383.4	DN 300mm , length 900mm	nr	4		
	Valves and Penstocks				
	Gate Valves - Hand Operated				
5.5J860.1	DN 800mm, double flange	nr	2		
5.5J860.2	DN 600mm, double flange	nr	2		
5.5J860.3	DN 400mm, double flange	nr	2		
	CLASS N: MISCELLANEOUS METALWORKS				
5.5N130	GMS ladder 400mm wide with stringers and rungs fabricated from 40mm and 30mm Dia. M.S tubes respectively	nr	8		
	Page Total Carried Forward to Collection				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
5.6	**ELECTROMECHANICAL WORKS IN FLOCCULATION UNITS**				
	CLASS N: MISCELLANEOUS METAL WORK				
	All steelwork to be completely cleaned by acid dipping prior to galvanising				
5.6N.1	40mm Galvanised mild steel tubular balustrades guardrails all framed and welded together, including all necessary labours and fittings on tubing:as shown in the drawings SRC/W/02-01-01	m	110		
	CLASS V: PAINTING				
	Provide, prepare and apply one coat mordant solution, one undercoat and two coats gloss enamel paint on galvanised metal work externally on:				
5.6V.1	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	100		
	CLASS Z: OTHER BUILDING WORKS INCIDENTAL TO CIVIL ENGINEERING WORKS				
5.6Z.1	Provide and installation all electrical fittings for street lighting from the chemical house and Sedimentation basin area as directed by the Engineer. Include for complete wiring, installation of powersockets and connection to existing grid as directed by the Engineer.	nr	10		
5.7	**ELECTROMECHANICAL WORKS IN SEDIMENTATION BASINS (6 No.) NEW UNIT**				

	CLASS J: PIPEWORK- FITTINGS AND VALVES				
	Bends - Long Radius				
5.7J.1	DN 250, 90 ^{0} GIS	nr	1		
	Tube settlers Modules				
5.7J.2	Suppy,assemble and fix the Tube settlers modules (560) IFR6024 - or EQUIVALENT; 24" (610mm) high x 12"(305mm) wide x 120"(3048mm) as shown in drawings SRC/W/03-01 to 03-03 ,and to manufactures specifications	m^2	693		
	CLASS M: STRUCTURAL METALWORK				
	Support system for tube settlers frame- stainless steel Grade 316				
	Fabrication of members for frames staight on plan				
5.7M.1	Provide and fix continous stainless steel G 316 hollow section bars to specifications as shown in the drawings; 75 x 75x 5mm thick angle sections; including cutting,weilding and concrete finshing at the wall joints; see drawing SRC/W/02-07	m	475		
	CLASS N: MISCELLANEOUS METAL WORK				
	Trough and Outflow channel				
5.7N.1	5 mm thick, 10.75m long 400x300 mm Stainless Steel G316 settled water V-notched weir decanting trough	nr	18		
5.7N.2	Supply and Install epoxy coated cone dispersion baffle units	nr	6		

	CLASS V: PAINTING				
	Provide, prepare and apply painted with one coat of red oxide and two coats of aluminium paint				
5.7V.1	Hand-rail pipe and fittings including 900 mm high level balustrades	m^2	100		
	Page Total Carried Forward to Collection				

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
5.8	**ELECTROMECHANICAL WORKS IN FILTERS (12 No.) NEW UNIT**				
	CLASS J: PIPEWORK- FITTINGS AND VALVES				
5.8J.1	Provide a Provisional sum PC of Kshs. 200,000 for the works under repair, change any broken pipe and fittings , seal for all damaged joints for pipework in the filter gallery to the Engineer's approval.	PC sum			200,000
5.8J.2	Contractor's profit and overhead	%			
5.8J.3	Supply and Install filter nozzles devices.	nr	4500		
	BILL No. 5.9: EQUIPMENT NEW UNIT				
	Supply, install, test and commission in accordance to BS 7671:2008, the following as described below:				

5.9.1	**Sludge Pumps**				
5.9.1.1	Open impeller pumps with a gauge of 30mm complete with cable (50m) and starter with a duty of H=10m for Q=50m^3/hr	nr	6		
5.9.2	**Monitoring Units**				
5.9.2.1	Supply and Install backwash level with maximum and minimum indicator switches complete with cable(100m) monitored at the operation office.	nr	12		
5.10	**ELECROMECHANICAL WORKS IN INTAKE: WEIR, WINGWALL AND FLUSHING SLUICE**				
	CLASS N: MISCELLANEOUS METAL WORK				
`	-				
5.10N.1	Supply and install flashing gates to AWWC501-92 to fit 1.0m by 1.0m complete with its frame and manual operating hand wheel	nr	1		
5.10N.2	Supply and install a 3.90m by 3.20m Avio gate fitted at the intake orifice, the Costs include clamping and anchoring, materials & equipment, shipping charges, and installation	nr	1		
5.10N.3	Stainless steel cat ladder for access to the flush gates not exceeding 3m high	nr	2		
5.11	**ELECTROMECHANICAL WORKS IN THE SETTLING BASIN AND FOREBAY**				
	CLASS J: PIPEWORK- FITTINGS				
	Tube settlers Modules				
5.11J.1	Supply,assemble and fix the Tubesettlers modules (560) IFR6024 - 24"(610mm) high x 12"(305mm) wide x 120"(3048mm) as shown in drawings SRC/W/01-02 ,and with manufacturer's specifications clause 6.1.5	m^2	448		

	CLASS M: STRUCTURAL METALWORK				
	Support system for tube settlers frame- stainless steel Grade 316				
	Fabrication of members for frames staight on plan				
5.11M.1	Provide and fix continous stainless steel G 316 hollow section bars to specifications as shown in the drawings ; 250 x 250x 3mm thick square sections ;including cutting,weilding and concrete finshing at the wall joints; as shown in drawings SRC/W/01-08	m	200		
	Page Total Carried Forward to Collection				
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
	CLASS N: MISCELLANEOUS METAL WORK				
5.11N.1	Supply and fix stainless steel coarse screen, size 2000x1500mm, fabricated using stainless steel bars, dia 10 mm at spacing 50 mm and at vertical angle 90 degrees. Include for provision and fixing of frame into concrete walls. All as per details on drawing SRC/W/01-09	nr	1		
5.11N.2	Supply and install two penstocks to Bs 7775:2005 to fit 1.0m by 1.0m at inlet of the settling basin complete with its frame and manual operating hand wheel	nr	2		
5.11N.3	Supply and install two penstocks to Bs 7775:2005 to fit 0.3m by 0.3m outlet flushing gates complete with its frame and manual operating wheel	nr	2		

5.11N.4	Supply and install penstocks to Bs 7775:2005 to fit , 1.0m by 1.0m at the outlet to the forebay complete with its frame and manual operating hand wheel	nr	2		
5.11N.5	Stainless steel cat ladder to access to the flush gates not exceeding 3m high ,including cutting,weilding and concrete finshing at the wall joints	nr	2		
5.11N.6	Supply and install new lockable galvanized mild steel sheet metal cover over access manholes to Intake Chamber, size 600mm x 600mm to details and as shown on drawings	Nr	6		
5.11N.7	Supply and install new stainless steel Step Irons on walls of fore-bay Chamber.	Nr	2		
5.11N.8	Supply and fix stainless steel fine screen, size 3700mm x 1500mm, fabricated using stainless steel bars, dia 12mm at spacing 50mm,	Nr	3		
5.11N.9	Supply and fix galvanized mild steel open grating cover over access to forebay Chamber, size 1500mm x 500mm to match the existing plates	Nr	3		
5.11N.10	Provide and fix 40 mm diameter tubing Class B throughout of handrail and parallel middle rail 450 mm below the hand rail with balusters at maximum 1500 mm centres all as detailed	m	165		
	Page Total Carried Forward to Collection				
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**

No.				(Kshs)	(Kshs)
	BILL No. 5.12: CLEAR WATER PUMP HOUSE				
	NOTES:				
	CLEAR WATER PUMPS				
	The works within the New and Old pumphouse will involve replacing the existing and operating pumps. The working space will be restricted and in proximity to operating pump and live power cables. The new seven clear water pumps; two sets of three pumps each that supply water to the New and old towns respectively are in two stand alone systems where two duty pumps and one standby pump are to feed to an existing clear water main , while Bendo will be supplied by one pump . These pumps will be installed and commissioned to ensure uninterrupted supply of water to their respective supply areas				
	Specific conditions in execution of Works in such conditions will be deemed to be included in the Contractor's Rates. Once started, the works are expected to proceed speedily to commissioning which may require use of rapid hardening cement (where necessary). The Contractor will be required to submit Method Statement for execution of Works in these specific conditions for approval prior to execution of the Works. The conditions include, but are not limited to the following:				
	i) The contractor to maintain continous operation of the operating pump iii) Safety against and for moving mechanical parts, live cables and noise including and not limited to insulated partitions. iv) Safety hoarding, lighting, bands, warning signs, etc to be maintained at all times				

	CLASS A: GENERAL ITEMS				
	Method Related Charges				
	The tenderer may insert in the Bill of Quantities such items for Method-Related-Charges as he may decide to cover items of work relating to his intended method of executing the works, the cost of which are not to be considered as proportional to the quantities of the other items and which are not allowed in the rates and prices for the other items.				
5.12A.1	Provision of Materials and Equipment	sum			
5.12A.2	Provision for keeping section of the sump free of water during dismantling and installation of suction pipe	sum			
5.12A.3	Provision of Site Safety Supervision	weeks	8		
5.12A.4	Provision of Method Related Supervision	weeks	8		
Page Total Carried Forward to Collection					**-**
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**
No.				**(Kshs)**	**(Kshs)**
	BILL No. 5.13: CLEAR WATER PUMPS				
	CLASS A: GENERAL ITEMS				
	Other Provisional Sums				
	CLEAR WATER PUMPS				

	OLD -TOWN				
5.13A.1	Allow PC sum for all costs to supply and install 3 no. pumps with a duty of 355m^3/hr againist a head of 60m on a common base frame, complete with motor, soft start control panels with good features of protection as well as indication of motor performance ;all the motors are fitted with PTC150 thermistor to protect against overheating; working 2 duty and 1 standby	Sum	1	11,000,000	11,000,000.00
	NEW -TOWN				
5.13A.2	Allow for all costs to supply and instnall 3no. pumps with a duty of 760m^3/hr againist a head of 75m on a common base frame complete with motor, soft start control panels with good features of protection as well as indication of motor performance ;all the motors are fitted with PTC150 thermistor to protect against overheating; working 2 duty and 1 standby	Sums	1	16,000,000	16,000,000.00
	BENDO ESTATE				
5.13A.3	Allow a for all cost to supply and instnall 1no. pumpwith a duty of 120m^3/hr againist a head of 118m on a common base frame complete with motor, soft start control panels with good features of protection as well as indication of motor performance ;all the motors are fitted with PTC150 thermistor to protect against overheating; working 2 duty and 1 standby	Sums	1	2,500,000	2,500,000.00
5.13A.4	Percentage adjustment to provisional sum in Items 2.7A-1 to 2.7A-3 and to allow for contractors handling fee and profits	%			-

5.13A.5	**Allow for all cost to provide clean water tank level indicator complete with cables to full, 50% full and empty monitored in the pump house and control room**	sum	4		
	-				
Page Total Carried Forward to Collection					
	ELECTRICAL INSTALLATION WORKS				
Item	**Description**	**UNIT**	**QUANTITY**	**Rate (Kshs)**	**Cost (Kshs)**
	The Contractor shall supply labour and supply, deliver, install, fix, connect, test, label and commission the works outlined here below, clean, complete and working to every detail as described in the specification and by related specifications and on the drawings listed in the Schedule or Drawings to the satisfaction of the Consulting Engineers.				
A1.01	**Main Power supply Switchgear /Change Over**				
	Supply and deliver to site 1 No. free standing L.V switchboard as per attached schematics, Design-verified switchgear and control gear assemblies conforming to IEC 61439 standards conforming to Form 3b type 2 cubicle pattern to IP54 protection and to specifications, comprising of Schneider, Legrand, Merlin Gerin, Terasaki or ABB switchgear.The board should comprise of a termination point for connection of remote signals required. **The switchboard should comprise the following switchgear:** **Automatic changeover (Mains to Generators)** Supply & Install an Automatic Changeover System in- built within the LV Panel with the following mechanism: - MUST be BMS compatible and the interphase				

	module(s) for MODBUS (RTU) link incorporated to monitor as a minimum the following: Mains available & Mains on Load, Generator Available & Generator on load,voltage, current, kW, kWh, KVA, power factor etc. The MFP should be such that in event of mains power outage, it picks up available supply from the generator selector panel.It should consist of 4P motorised automatic changeover with mechanical & electrical interlocks, with adjustable over current ratings, auto changeover, control unit, under/ over voltage sensing relays on all the phases and any other necessary accessories, instrumentation and controls.				
	Supply & Install a 3200 Amps 4P motorised automatic mains & generator changeover. This should comprise of:- 3200 Amps 4P mechanically and electrically interlocked motorised Adjustable MCCBs and associated PLC, with adjustable overcurrent settings, having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w c/w extension busbars. Supply & install control unit for auto-changeover Type UA-1 or equivalent. Supply & install under/over voltage sensing relay. Supply and Install set of indication to show mains supply Available / In use or generator supply Available/ In use. Supply and Install set of voltage free normally open/closed contacts for generator start/stop signal. **Main Busbars** 3500 A rated TP copper busbars 3500A sized Neutral bar 1800 A sized Earthing bar **LV BOARD MAIN INCOMER** 1 No. 3200A 4P Adjustable MCCB c/w shunt trip	**ITEM**	1		

	having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w extension busbars. **LV BOARD OUTGOERS** 1No. 800A 3P Adjustable MCCB having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w extension busbars.FOR FIRE SYSTEMS 1 No. 1600A 3P Adjustable MCCB having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w extension busbars. 1 No. 1600A 3P Adjustable MCCB having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w extension busbars. 1No. 800A 3P Adjustable MCCB having a short circuit breaking capacity of 50KA at 415Vac, 50Hz c/w extension busbars. 1No. 100A rated Adjustable 3P MCCB 1No. 100A rated Adjustable 3P MCCB **Surge protection** Should include a good quality furse surge arrestor or equivalents				
A2.01	**500KVAr POWER FACTOR CORRECTION BANK** **-** The PFC should be free standing, FTTA, modular, extensible, metal clad, cubicle pattern to IP42 rating. - The PFC should comprise of also a termination point for connection of remote signals. - MUST be BMS compatible and the interphase module(s) for BACNET link incorporated to monitor all parameters. - The PFC Should have the following steps: a. 1No. 50 KVar Fixed capacitor complete with appropriatly sized fuses for capacitor protection and special contactors for capacitor switching. b. 500 KVAR rated capacitor bank with 1x100 Kvar 4x50 KVar, 5x20 KVar, 5x10 & 10x5KVar rated capacitors, complete with appropriatly sized fuses for capacitor protection and special contactors for	No	1		

	capacitor switching. NB: The PFC board's Digital power logic meter should have an ethernet monitoring port and should allow for connection via BACNet IP Protocol				
B1	**LV Switchgear Cabling (Supply & Install)**				
	Cabling				
	The Contractor shall supply labour and supply, deliver, install, fix, connect, test, label and commission the works, clean, complete and working to every detail as described below and in the related specifications and /or on the drawings to the satisfaction of the Consulting Engineers. **NOTE: All Cabling to be as East African Cables or similar equivalent.**				
B1.01	400mm sq PVC Single Core XPLE CU Cable (From TX LV Side smart meter, isolation panel & Genset side to **Main LV BOARD panel and to Existing LV board**). Wired in 3 runs / phase + 2 runs of Neutral.	LM	745		
B1.02	240mm^2 PVC Single Core XPLE CU Cable (From LV board to PFC). Wired in 2 runs / phase + 1 runs of Neutral	LM	154		

B1.03	400mm^2 Cable glands for CU cables above.	No.	98		
B1.04	400mm^2 Ideal Cable lugs for CU cables above.	No.	98		
B1.05	240mm^2 Cable glands for CU cables above.	No.	14		
B1.06	240mm^2 Ideal Cable lugs for CU cables above.	No.	14		
B1.07	Allow for cable ties for fastening all the above cables at every 300mm interval	Item	1		
C1	**Cable Ladders (Supply & Install)**				
C1.01	**INTERNAL: Gauge 16 galvanized** 500mm x 100mm deep cable ladder for cabling c/w all accessories	LM.	80		
C2	**<u>Power Duct Work (Supply & Install)</u>**				
C2.01	Trenching upto 1000mm deep, laying of sleeves, backfilling and compacting for power cables	LM	150		
C2.02	10000 x 1000 x 1000mm deep POWER manhole-masonry blocks to civil Engineers Details with a top concrete slab-Concrete class as 20/25 to take pre-fabricated steel manhole covers as noted below. The expected concrete volume is 0.21 cubic metres	No.	4		
C2.03	Concrete plinth structure 3000mm by 1200mm by 200mm by with all steel structure works for street lighting poles.	No.	1		
C2.04	**POWER MANHOLE COVERS:** Steel 600mm-dia Manhole Covers Manufactured under BS 497 & En-124 Standards c/w all Frame, Anchors and all other accessories. The steel Cover should be Rated as MEDIUM GAUGE (C250) should be engraved 'POWER' as EAFW	No.	4		

C2.05	300mm heavy gauge PVC sleeves for power cables complete with Concrete surround encasement for sleeves	LM	45		
C2.06	150mm heavy gauge PVC sleeves for power Concrete surround encasement for sleeves	LM	45		
C2.07	9'' culvert/sleeves for road crossing for KPLC supply cables.	LM	0		
C2.08	Supply and install 11mm cable markers for on both ends of the cables above.	Item	1		
Page Total Carried Forward to Collection					
ITEM No.	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (Kshs)**	**AMOUNT (Kshs)**
	COLLECTION				
1	BROUGHT FORWARD FROM PAGE 1				
2	BROUGHT FORWARD FROM PAGE 2				
3	BROUGHT FORWARD FROM PAGE 3				
4	BROUGHT FORWARD FROM PAGE 4				
5	BROUGHT FORWARD FROM PAGE 5				
6	BROUGHT FORWARD FROM PAGE 6				-

7	BROUGHT FORWARD FROM PAGE 7				-
8	BROUGHT FORWARD FROM PAGE 9				
	BILL TOTAL TAKEN TO COLLECTION				

UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT PHASE 2
(THIWASCO/046/UTPRP/2022-2023)

BILL No.6: SCHEDULE OF DAYWORKS

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	NOTE: THE WHOLE OF THIS BILL IS PROVISIONAL				
	LABOUR				
	The rates inserted herein should include for all costs such as insurance, travelling time, overtime, accommodation, use and maintenance of small tools of trade, supervision, overheads and profit. Only time engaged upon work will be paid for				
A	Unskilled Labourer	Hrs	250		
B	Skilled Labour	Hrs	100		
C	Stone Mason	Hrs	100		
D	Electrician	Hrs	100		
E	Gaffer	Hrs	100		
F	Mechanic	Hrs	100		
G	Driver	Hrs	150		
H	Plant Operator	Hrs	150		

I	Carpenter	Hrs	150		
J	Concretor	Hrs	100		
K	Blaster (Certified)	Hrs	30		
L	Pipelayer	Hrs	100		
M	Painter	Hrs	30		
N	Surveyor	Hrs	30		
O	Foreman	Hrs	100		
P	Watchman (including use of firewood, lights, day, night, Sunday and Public Holiday watching)	Hrs	100		
	PAGE TOTAL CARRIED TO SECTION COLLECTION SHEET				

	PLANT/DAYWORK EQUIPMENT The rates inserted herein should include for all operational and maintenance costs, fuel, oil, grease, operators, turnboys, supervision, overhead and profits. Only the time actually employed on works will be paid for and the rates should include for idle, travelling and overtime				
A	Compressor (3.0 m^3/minute)	Hrs	40		
B	D4 Tractor	Hrs	30		
C	Concrete Vibrator (Petrol or Diesel)	Hrs	30		
D	Concrete Mixer 14/10 (including batch weighing gear and drag feed shovel)	Hrs	80		
E	Dumper 0.38 m^3	Hrs	40		
F	Tandem 3 wheels roller. Dead weight 9 tonnes	Hrs	30		
G	5 Tonne Lorry (Tipper)	Hrs	30		
H	7 Tonne Lorry (Tipper)	Hrs	30		
I	10 Tonne Lorry (Tipper)	Hrs	30		
J	Portable water pump 50mm diameter (inclusive of hoses, couplings, etc.)	Hrs	50		
K	Oxy-Acetylene cutting and welding set, including oxygen and acetylene	Hrs	80		
L	Electric welding set including electrodes	Hrs	50		

M	Mechanical Pressure Testing Equipment	Hrs	30		
N	Block Making Machine (for Block Size 200mm x 200mm x 450mm)	Hrs	80		
O	Back Hoe Excavator	Hrs	30		
P	Generator, Mobile, 10kva	Hrs	50		
Q	Plate Vibrator	Hrs	50		
R	Mobile Crane	Hrs	20		
S	Bull Dozer	Hrs	20		
T	Excavator, dragline	Hrs	20		
U	Excavator, Hydraulic	Hrs	20		
V	Wheel Loader	Hrs	30		
W	Grader	Hrs	20		

PAGE TOTAL CARRIED TO SECTION COLLECTION PAGE

	MATERIALS All materials are to comply with the Specifications. The rates inserted herein are to include for delivery to site, storage, handling, overheads and profits				
A	Ordinary Portland Cement	Tonne	3		
B	Mild steel (any size from 8mm to 25mm dia.)	Kg	20		
C	High tensile steel (any size from 8mm to 15mm dia.)	Kg	20		
D	Fine aggregate for concrete	m^3	20		
E	Coarse aggregate for concrete	m^3	20		
F	Use of shuttering timber	m^2	30		
G	Murram	m^3	20		
H	Concrete Class 15/20	m^3	10		
K	Concrete Class 20/20	m^3	10		
L	Concrete Class 30/20	m^3	10		
M	Drainage Sand	m^3	20		

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PART III - CONDITIONS OF CONTRACT AND CONTRACT FORMS

SECTION VIII - GENERAL CONDITIONS OF CONTRACT

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 work**s 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) **Equipmen**t 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 i**s 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[6], and
i) any other document **listed in the SCC** as forming part of the Contract.

[6] *In lump sum contracts, delete "Bill of Quantities" and replace with "Activity Schedule."*

3. Language andLaw

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 andEquipment

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 effect 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 Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause 24.3.

242 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.

243 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.

244 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[7]

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[8]

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.

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[7] *In 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.

[8] *In 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.

[9] *In lump sum contracts, add "and Activity Schedules" after "Programs."* [10] *In 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 Sub-Clause 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[11], 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: *(corrected tender price – tender price)/tender price X 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.

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[11] *In lump sum contracts, add "or Activity Schedule" after "Program."*

[12] *In 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 y 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 Im/Io

where: P is the adjustment factor for the portion of the Contract Price payable.

A and B are coefficients[13] **specified in the SCC,** representing the non-adjustable and adjustable portions, respectively, of the Contract Price payable and Im is the index prevailing at the end of the month being invoiced and IOC 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.

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[13] *The 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 has 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 wasmade.

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 : **Thika Water and Sewerage Company Ltd** **P.o Box 6103-01000,Thika.**
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be *[24months after contract signature]*
GCC 1.1 (x)	The Project Manager is: **Eng. Mburu Kiemo** **Thika Water and Sewerage Company Ltd** **P.o Box 6103-01000, Thika**.
GCC 1.1 (z)	The Site is located at *[main officesThika Water Treatment Works]* and is defined in drawings No. *[all drawings are attached as annexure 1]*
GCC 1.1 (cc)	The Start Date shall be *[insert date]*.
GCC 1.1 (gg)	The Works consist of *[UPGRADE OF THIKA WATER TREATMENT PLANT REHABILITATION PROJECT PHASE 2 (THIWASCO/046/UTPRP/2022-2023)*
GCC 2.2	Sectional Completions are: *[not appropriate]*
GCC 5.1	The Project manager *[may]* delegate any of his duties and responsibilities.
GCC 8.1	Schedule of other contractors: *[not appropriate]*
GCC 9.1	**Key Personnel** GCC 9.1 is replaced with the following: 9.1 Key Personnel are the Contractor's personnel named in this GCC 9.1 of the Special Conditions of Contract. 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. [insert the name/s of each Key Personnel agreed by the Procuring Entity prior to Contract signature.
GCC 13.1	The minimum insurance amounts and deductibles shall be: (a) for loss or damage to the Works, Plant and Materials: *[1,000,000]*. (b) For loss or damage to Equipment: *[2,000,000]*. (c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract *[2,000,000]*. (d) for personal injury or death: (i) of the Contractor's employees: *[2,000,000]*. of other people: *[1,500,000*

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 14.1	The Site Possession Date(s) shall be: *[14 days after Contract signing]*
GCC 20.1	The Site Possession Date(s) shall be: *[as shall be agreed by both parties]*
GCC 23.1 & GCC 23.2	Appointing Authority for the Adjudicator: National Centre for International Arbitration.
	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: *[their rates per hour]*.
B. Time Control	
GCC 26.1	The Contractor shall submit for approval a Program for the Works within *[14]* days from the date of the Letter of Acceptance.
GCC 26.3	The period between Program updates is [30] days. The period for submission of progress reports is 30days. The amount to be withheld for late submission of an updated Program & progress reports is *[100,000]*.
C. Quality Control	
GCC 34.1	The Defects Liability Period is: *[12]* months.
D. Cost Control	
GCC 38.9	If the value engineering proposal is approved by the Procuring Entity the amount to be paid to the Contractor shall be 10% *(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 *["does not"]* apply. The coefficients for adjustment of prices are: (a) *[not applicable]* percent nonadjustable element (coefficient A). (ib) *[not applicable]* percent adjustable element (coefficient B). (c) The Index I for shall be *[not applicable]*.
GCC 46.1	The proportion of payments retained is: *[10%]*
GCC 47.1	The liquidated damages for the whole of the Works are *[0.1%]* per day. The maximum amount of liquidated damages for the whole of the Works is *[10%]* of the final Contract Price.
GCC 48.1	The Bonus for the whole of the Works is *[Not applicable]* per day. The maximum amount of Bonus for the whole of the Works is *[Not applicable]* of the final Contract Price. *Not applicable*
GCC 49.1	The Advance Payments shall be: *[Not applicable]* and shall be paid to the Contractor no later than *[Not applicable]*. *Not applicable*

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
GCC 50.1	The Performance Security amount is *[insert amount(s) denominated in the types and proportions of the currencies in which the Contract Price is payable, or in a freely convertible currency acceptable to the* Procuring Entity*]* (a) Performance Security – Bank Guarantee: in the amount(s) of *[10.0%]* 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 *[10.0%]* 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 *[30 days after expiry of Time for Completion of Works]*. The date by which "as built" drawings are required is *[30 days after expiry of Time for Completion of Works]*.
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 *[500,000]*.
GCC 57.2 (g)	The maximum number of days is: *[60]*.
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 *[Not applicable]*.

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 Tender 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.

SNo	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*]

ii) Agency: [*insert name of Procuring Entity*]

iii) 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 of ……dated the…day of …….20…….in the matter of Tender No……..…of ……..20….. 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 of ……....20….……

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.*

[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The 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 Obligee (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 behalfof 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 ,[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.

[1] *The 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.*

[2] *Insert 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*_____*])*[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the 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.

[1]*The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.*

[2]*Insert 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

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. 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 Tenderer by meeting one or more of the following conditions:

- *Directly or indirectly holding 25% or more of the shares.*
- *Directly or in directly holding 25% or more of the voting rights.*
- *Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

Tender Reference No.:_____[*insert identification no*]

Name of the Assignment:_____*[insert name of the assignment]* to:

_____*[insert complete name of Procuring Entity]*

In response to 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

Identity of Beneficial Owner	**Directly or indirectly holding 25% or more of the shares (Yes / No)**	**Directly or indirectly holding 25 % or more of the Voting Rights (Yes / No)**	**Directly or indirectly having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer (Yes / No)**
[include full name (last, middle, first), nationality, country of residence]			

OR

ii) We declare that there is no Beneficial Owner meeting one or more of the following conditions: directly or indirectly holding 25% or more of the shares. Directly or indirectly holding 25% or more of the voting rights. Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.

OR

We declare that we are unable to identify any Beneficial Owner meeting one or more of the following conditions. [If this option is selected, the Tenderer shall provide explanation on why it is unable to identify any Beneficial Owner]

Directly or indirectly holding 25% or more of the shares. Directly or indirectly holding25% or more of the voting rights.

Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer]"

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]*

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], [inse