

REPUBLIC OF KENYA



MINISTRY OF WATER & SANITATION AND IRRIGATION



NORTHERN WATER WORKS DEVELOPMENT AGENCY

TENDER DOCUMENT FOR EXTENSION OF GRIFTU-BILATULAMIN
WATER SUPPLY PROJECT

TENDER NO. NWWDA/T/CW/002/2023-2024

PROCURING ENTITY

NORTHERN WATER WORKS DEVELOPMENT AGENCY

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TABLE OF CONTENTS

INVITATION TO TENDER	V
APPENDIX TO THE PREFACE	vii
GUIDELINES FOR PREPARATION OF TENDER DOCUMENTS	vii
2. PART 1 - TENDERING PROCEDURES	vii
3. PART 2 - PROCUREMENT ENTITY'S REQUIREMENTS	vii
4. PART 3 - CONDITIONS OF CONTRACT AND CONTRACT FORMS	viii
INVITATION TO TENDER	X
<u>SECTION I - INSTRUCTIONS TO TENDERERS</u>	1
A. General Provisions	1
1. Scope of Tender	1
2. Fraud and Corruption	1
3. Eligible Tenderers	1
4. Eligible Goods, Equipment, and Services	3
5. Tenderer's Responsibilities	3
B. Contents of Tender Documents	3
6. Sections of Tender Document	3
7. Site visit	4
8. Pre-Tender Meeting	4
9. Clarification and amendment of Tender Documents	5
10. Amendment of Tender Documents	5
C. Preparation of Tenders	5
11. Cost of Tendering	5
12. Language of Tender	5
13. Documents Comprising the Tender	5
14. Form of Tender and Schedules	6
15. Alternative Tenders	6
16. Tender Prices and Discounts	6
17. Currencies of Tender and Payment	7
18. Documents Comprising the Technical Proposal	7
19. Documents Establishing the Eligibility and Qualifications of the Tenderer	7
20. Period of Validity of Tenders	8
21. Tender Security	8
22. Format and Signing of Tender	9
D. Sealing and Marking of Tenders	9
23. Sealing and Marking of Tenders	9
24. Deadline for Submission of Tenders	10
25. Late Tenders	10
26. Withdrawal, Substitution, and Modification of Tenders	10
27. Tender Opening	10
E. Evaluation and Comparison of Tenders	11
28. Confidentiality	11
29. Clarification of Tenders	11
30. Deviations, Reservations, and Omissions	12
31. Determination of Responsiveness	12
32. Non-material Non-conformities	12
33. Arithmetical Errors	12
34. Conversion to Single Currency	13
35. Margin of Preference and Reservations	13
36. Subcontractors	i

37.	Evaluation of Tenders	13
38.	Comparison of Tenders.....	14
39.	Abnormally Low Tenders.....	14
40.	Abnormally High Tenders	14
41.	Unbalanced and/or Front-Loaded Tenders	14
42.	Qualifications of the Tenderer	15
43.	Best Evaluated Tender	15
44.	Procuring Entity's Right to Accept Any Tender, and to Reject Any or All Tenders	15
F.	Award of Contract.....	15
45.	Award Criteria	15
46.	Notice of Intention to enter into a Contract.....	15
47.	Standstill Period	16
48.	Debriefing by the Procuring Entity	16
49.	Letter of Award.....	16
50.	Signing of Contract	16
51.	Appointment of Adjudicator.....	16
52.	Performance Security	16
53.	Publication of Procurement Contract	17
53.	Procurement Related Complaints.....	17
	SECTION II-TENDER DATA SHEET(TDS)	18
	SECTION III - EVALUATION AND QUALIFY ON CRITERIA.....	23
1.	General Provisions	23
2.	Preliminary examination for Determination of Responsiveness	23
3.	Tender Evaluation (ITT 35).....	23
4.	Multiple Contracts.....	23
5.	Alternative Tenders (ITT 13.1).....	24
6.	Margin of Preference is not applicable.....	24
7.	Post qualification and Contract award (ITT 39), more specifically.....	24
	SECTION IV – TENDERING FORMS	25
	QUALIFICATION FORMS.....	28
1.	Form Equ. Equipment	28
2.	Form per-1.....	29
4.	FORM PER-2:.....	30
5.	TENDERERS QUALIFICATION WITHOUT PRE-QUALIFICATION.....	32
	FORM ELI -1.1	32
	FORM ELI -1.2.....	33
	FORM CON – 2	34
5.4	FORM FIN – 3.1:.....	36
5.5	FORM FIN – 3.2:.....	37
5.6	FORM FIN – 3.3:.....	38
5.7	FORM FIN – 3.4:.....	38
5.8	FORM EXP - 4.1.....	39
5.9	FORM EXP - 4.2(a)	40
5.11	FORM EXP - 4.2(b)	41
	OTHER FORMS	42
6.	FORM OF TENDER.....	42
a)	TENDERER'S ELIGIBILITY- CONFIDENTIAL BUSINESS QUESTIONNAIRE	45
b)	CERTIFICATE OF INDEPENDENT TENDER DETERMINATION	48

c)	SELF-DECLARATION FORM - SELF DECLARATION OF THE TENDERER.....	49
d)	APPENDIX 1- FRAUD AND CORRUPTION	52
7.	FORM OF TENDER SECURITY - DEMAND BANK GUARANTEE.....	54
8.	FORM OF TENDER SECURITY (INSURANCE GUARANTEE).....	55
9.	FORM OF TENDER-SECURING DECLARATION.....	56
10.	APPENDIX TO TENDER	57
PART II - WORK REQUIREMENTS.....		58
SECTION V - DRAWINGS		58
SECTION VI - SPECIFICATIONS		58
SECTION VII - BILLS OF QUANTITIES.....		59
1.	Objectives.....	59
2.	Day work Schedule	59
3.	Provisional Sums.....	59
4.	The Bills of Quantities	59
PART III-CONDITIONS OF CONTRACT AND CONTRACT FORMS.....		60
SECTION VIII - GENERAL CONDITIONS OF CONTRACT.....		60
A. General		
1.	Definitions	61
2.	Interpretation	61
3.	Language and Law	62
4.	Project Manager's Decisions	63
5.	Delegation	63
6.	Communications.....	63
7.	Subcontracting.....	63
8.	Other Contractors	63
9.	Personnel and Equipment.....	63
10.	Procuring Entity's and Contractor's Risks	63
11.	Procuring Entity's Risks	63
12.	Contractor's Risks.....	64
13.	Insurance	64
14.	Site Data	64
15.	Contractor to Construct the Works.....	64
16.	The Works to Be Completed by the Intended Completion Date	64
17.	Approval by the Project Manager.....	64
18.	Safety.....	65
19.	Discoveries	65
20.	Possession of the Site	65
21.	Access to the Site.....	65
22.	Instructions, Inspections and Audits.....	65
23.	Appointment of the Adjudicator	65
24.	Settlement of Claims and Disputes.....	66
25.	Fraud and Corruption	68
B. Time Control		68
1.	Program	68
2.	Extension of the Intended Completion Date.....	69
3.	Acceleration.....	69
4.	Delays Ordered by the Project Manager.....	69
5.	Management Meetings	69
6.	Early Warning	70

C. Quality Control.....	69
1. Identifying Defects.....	69
2. Tests.....	69
3. Correction of Defects.....	69
4. Uncorrected Defects.....	69
D. Cost Control.....	70
1. Contract Price.....	70
2. Changes in the Contract Price.....	70
3. Variations.....	71
4. Cash Flow Forecasts.....	72
5. Payment Certificates.....	72
6. Payments.....	72
7. Compensation Events.....	73
8. Tax.....	73
9. Currency of Payment.....	73
10. Price Adjustment.....	73
11. Retention.....	74
12. Liquidated Damages.....	74
13. Bonus.....	74
14. Advance Payment.....	74
15. Securities.....	75
16. Dayworks.....	75
17. Cost of Repairs.....	75
E. Finishing the Contract.....	75
1. Completion.....	75
2. Taking Over.....	75
3. Final Account.....	75
4. Operating and Maintenance Manuals.....	75
5. Termination.....	76
6. Payment upon Termination.....	76
7. Property.....	76
8. Release from Performance.....	76
SECTION IX - SPECIAL CONDITIONS OF CONTRACT.....	77
SECTION X - CONTRACT FORMS.....	88
FORM No. 1 - NOTIFICATION OF INTENTION TO AWARD.....	80
FORM No. 2 – REQUEST FOR REVIEW.....	83
FORM No. 3 - LETTER OF AWARD.....	83
FORM No. 4 - CONTRACT AGREEMENT.....	84
FORM No. 5 - PERFORMANCE SECURITY [Option 1 - Unconditional Demand Bank Guarantee].....	85
FORM No. 6- PERFORMANCE SECURITY [Option 2– Performance Bond].....	86
FORM No. 7- ADVANCE PAYMENT SECURITY.....	88
FORM No. 8- RETENTION MONEY SECURITY.....	87
FORM No. 9- BENEFICIAL OWNERSHIP DISCLOSURE FORM.....	87

INVITATION TO TENDER

Open National Tender for EXTENSION OF GRIFTU- BILATULAMIN WATER SUPPLY PROJECT

1. The **Northern Water Works Development Agency** invites sealed tenders for **EXTENSION OF GRIFTU-BILATULAMIN WATER SUPPLY PROJECT**
2. Tendering will be conducted under open competitive tendering method using a standardized tender document and 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 **0900 to 1700 hours** at the address given below. Tender documents may be viewed and/or downloaded from the website www.nwwda.go.ke or www.tender.go.ke free of charge
4. Alternatively, a complete set of tender documents may be purchased or obtained by interested tenders upon payment of a non- refundable fees of Kshs 1,000.00 in cash or Banker's Cheque and payable to the address given below. Tender documents obtained electronically will be free of charge.
5. Tender documents may be viewed and downloaded for free from the website www.nwwda.go.ke . Tenderers who download the tender document must forward their particulars immediately to info@nwwda.go.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 90 days from the date of opening of tenders.
7. All Tenders must be accompanied by a “tender Security” of Kshs 1,000,000 (Bank Gurantee)
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 **26th September 2023 at 11.00 am**. *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 time 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:

Chief Executive Officer

Northern Water Works Development Agency

Maji House, Kismayu Road, Ground Floor Room A3

PO Box 495 – 70100 Garissa, Kenya

Tel: +254-46-2103598/3797

E-mail: info@nwwda.go.ke

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 (*wives, 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 they 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 19 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted;
 - g) Conformity: a technical proposal in accordance with ITT 18;
 - h) Any other document required in the **TDS**.
- 13.2 In addition to the requirements under ITT 11.1, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender,

together with a copy of the proposed Agreement. The Tenderer shall chronologically serialize pages of all tender documents submitted.

13.3 The Tenderer shall furnish in the Form of Tender information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Tender.

14. Form of Tender and Schedules

14.1 The Form of Tender and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tendering Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITT 20.3. All blank spaces shall be filled in with the information requested.

15. Alternative Tenders

15.1 Unless otherwise specified in the **TDS**, alternative Tenders shall not be considered.

15.2 When alternative times for completion are explicitly invited, a statement to that effect will be included in the **TDS**, and the method of evaluating different alternative times for completion will be described in Section III, Evaluation and Qualification Criteria.

15.3 Except as provided under ITT 13.4 below, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents must first price the Procuring Entity's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the Tenderer with the Winning Tender conforming to the basic technical requirements shall be considered by the Procuring Entity. When specified in the **TDS**, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the **TDS**, as will the method for their evaluating, and described in Section VII, Works' Requirements.

16. Tender Prices and Discounts

16.1 The prices and discounts (including any price reduction) quoted by the Tenderer in the Form of Tender and in the Bill of Quantities shall conform to the requirements specified below.

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

16.3 The price to be quoted in the Form of Tender, in accordance with ITT 14.1, shall be the total price of the Tender, including any discounts offered.

16.4 The Tenderer shall quote any discounts and the methodology for their application in the Form of Tender, in accordance with ITT 14.1.

16.5 It will be specified in the **TDS** if the rates and prices quoted by the Tenderer are or are not subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, except in cases where the contract is subject to fluctuations and adjustments, not fixed price. In such a case, the Tenderer shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Procuring Entity may require the Tenderer to justify its proposed indices and weightings.

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

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

17. Currencies of Tender and Payment

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

18. Documents Comprising the Technical Proposal

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

19. Documents Establishing the Eligibility and Qualifications of the Tenderer

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

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

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

19.4 Tenderers shall be asked to provide, as part of the data for qualification, such information, including details of ownership, as shall be required to determine whether, according to the classification established by the Procuring Entity, a contractor or group of contractors qualifies for a margin of preference. Further the information will enable the Procuring Entity identify any actual or potential conflict of interest in relation to the procurement and/or contract management processes, or a possibility of collusion between tenderers, and thereby help to prevent any corrupt influence in relation to the procurement process or contract management.

19.5 The purpose of the information described in ITT 19.4 above overrides any claims to confidentiality which a tenderer may have. There can be no circumstances in which it would be justified for a tenderer to keep information relating to its ownership and control confidential where it is tendering to undertake public sector work and receive public sector funds. Thus, confidentiality will not be accepted by the Procuring Entity as a justification for a Tenderer's failure to disclose, or failure to provide required information on its ownership and control.

19.6 The Tenderer shall provide further documentary proof, information or authorizations that the Procuring Entity may request in relation to ownership and control which information on any changes to the information which was provided by the tenderer under ITT 6.3. The obligations to require this information shall continue for the duration of the procurement process and contract performance and after completion of the contract, if any change to the information previously provided may reveal a conflict of interest in relation to the award or management of the contract.

19.7 All information provided by the tenderer pursuant to these requirements must be complete, current and accurate as at the date of provision to the Procuring Entity. In submitting the information required pursuant to these requirements, the Tenderer shall warrant that the information submitted is complete, current and accurate as at the date of submission to the Procuring Entity.

19.8 If a tenderer fails to submit the information required by these requirements, its tender will be rejected. Similarly, if the Procuring Entity is unable, after taking reasonable steps, to verify to a reasonable degree the information submitted by a tenderer pursuant to these requirements, then the tender will be rejected.

19.9 If information submitted by a tenderer pursuant to these requirements, or obtained by the Procuring Entity (whether through its own enquiries, through notification by the public or otherwise), shows any conflict of

interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process, then:

- i) if the procurement process is still ongoing, the tenderer will be disqualified from the procurement process,
- ii) if the contract has been awarded to that tenderer, the contract award will be set aside,
- iii) the tenderer will be referred to the relevant law enforcement authorities for investigation of whether the tenderer or any other persons have committed any criminal offence.

19.10 If a tenderer submits information pursuant to these requirements that is incomplete, inaccurate or out-of-date, or attempts to obstruct the verification process, then the consequences ITT 6.7 will ensue unless the tenderer can show to the reasonable satisfaction of the Procuring Entity that any such act was not material, or was due to genuine error which was not attributable to the intentional act, negligence or recklessness of the tenderer.

20. Period of Validity of Tenders

20.1 Tenders shall remain valid for the Tender Validity period specified in the **TDS**. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Procuring Entity in accordance with ITT 24). A Tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

20.2 In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 21.1, it shall also be extended for thirty (30) days beyond the deadline of the extended validity period. A Tenderer may refuse the request without forfeiting its Tender security. A Tenderer granting the request shall not be required or permitted to modify its Tender, except as provided in ITT 20.3.

20.3 If the award is delayed by a period exceeding the number of days to be specified in the **TDS** days beyond the expiry of the initial tender validity period, the Contract price shall be determined as follows:

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

21. Tender Security

21.1 The Tenderer shall furnish as part of its Tender, either a Tender-Securing Declaration or a Tender Security as specified in the **TDS**, in original form and, in the case of a Tender Security, in the amount and currency specified in the **TDS**. A Tender-Securing Declaration shall use the form included in Section IV, Tender Forms.

21.2 If a Tender Security is specified pursuant to ITT 19.1, the Tender Security shall be a demand guarantee in any of the following forms at the Tenderer's option:

- a) an unconditional Bank Guarantee issued by reputable commercial bank); or
- b) an irrevocable letter of credit;
- c) a Banker's cheque issued by a reputable commercial bank; or
- d) another security specified **in the TDS**,

21.3 If an unconditional bank guarantee is issued by a bank located outside Kenya, the issuing bank shall have a correspondent bank located in Kenya to make it enforceable. The Tender Security shall be valid for thirty (30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 20.2.

21.4 If a Tender Security or Tender-Securing Declaration is specified pursuant to ITT 19.1, any Tender not accompanied by a substantially responsive Tender Security or Tender-Securing Declaration shall be rejected by the Procuring Entity as non-responsive.

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

determined nonresponsive or a bidder declines to extend tender validity period.

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

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

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

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

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

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

22. Format and Signing of Tender

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

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

22.3 The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation as specified in the **TDS** and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.

22.4 In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.

22.5 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D. Submission and Opening of Tenders

23. Sealing and Marking of Tenders

23.1 Depending on the sizes or quantities or weight of the tender documents, a tenderer may use an envelope, package or container. The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the name and Reference number of the Tender, addressed to the Procuring Entity and a warning not to open before the time and date for Tender opening date. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:

- a) in an envelope or package or container marked "ORIGINAL", all documents comprising the Tender, as described in ITT 11; and

- b) in an envelope or package or container marked “COPIES”, all required copies of the Tender; and
- c) if alternative Tenders are permitted in accordance with ITT 15, and if relevant:
 - i) in an envelope or package or container marked “ORIGINAL –ALTERNATIVE TENDER”, the alternative Tender; and
 - ii) in the envelope or package or container marked “COPIES- ALTERNATIVE TENDER”, all required copies of the alternative Tender.

The inner envelopes or packages or containers shall:

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

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

29.2 If a tenderer does not provide clarifications of its tender by the date and time set in the Procuring Entity's request for clarification, its Tender may be rejected.

30. Deviations, Reservations, and Omissions

30.1 During the evaluation of tenders, the following definitions apply:

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

31. Determination of Responsiveness

31.1 The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the tender itself, as defined in ITT 13.

31.2 A substantially responsive Tender is one that meets the requirements of the Tender document without material deviation, **reservation, or omission. A material deviation, reservation, or omission is one that, if accepted, would:**

- a) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
- b) limit in any substantial way, inconsistent with the tender document, the Procuring Entity's rights or the tenderer's obligations under the proposed contract; or
- c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders.

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

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

32. Non-material Non-conformities

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

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

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

33. Arithmetical Errors

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

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

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

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

34. Currency provisions

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

35. Margin of Preference and Reservations

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

35.2 Where it is intended to reserve the contract to specific groups under Small and Medium Enterprises, or enterprise of women, youth and/or persons living with disability, who are appropriately registered as such by the authority to be specified in the **TDS**, a procuring entity shall ensure that the invitation to tender specifically indicates that only businesses/firms belonging to those specified groups are the only ones eligible to tender. Otherwise if no so stated, the invitation will be open to all tenderers.

36. Nominated Subcontractors

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

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

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

37. Evaluation of Tenders

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

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

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

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

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

38. Comparison of Tenders

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

39. Abnormally Low Tenders

39.1 An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price or that genuine competition between Tenderers is compromised.

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

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

40. Abnormally High Tenders

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

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

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

40.3 If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (*often due to collusion, corruption or other manipulations*), the Procuring Entity shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise, before retendering.

41. Unbalanced and/or Front-Loaded Tenders

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

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

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

42. Qualifications of the Tenderer

42.1 The Procuring Entity shall determine to its satisfaction whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

42.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 19. The determination shall not take into consideration the qualifications of other firms such as the Tenderer's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Subcontractors if permitted in the Tender document), or any other firm(s) different from the Tenderer.

42.3 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative

determination shall result in disqualification of the Tender, in which event the Procuring Entity shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated price to make a similar determination of that Tenderer's qualifications to perform satisfactorily.

42.4 An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price.

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

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

43. Best Evaluated Tender

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

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

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

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

F. Award of Contract

45. Award Criteria

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

46. Notice of Intention to enter into a Contract

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

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

47. Standstill Period

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

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

48. Debriefing by the Procuring Entity

- 48.1 On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 46, an unsuccessful tenderer may make a written request to the Procuring Entity for a debriefing on specific issues or concerns regarding their tender. The Procuring Entity shall provide the debriefing within five days of receipt of the request.
- 48.2 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending **such a debriefing meeting**.

49. Letter of Award

- 49.1 Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 42.1, upon addressing a complaint that has been filed within the Standstill Period, the Procuring Entity shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21 days 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 EXTENSION OF GRIFTU-BILATULAMIN WATER SUPPLY PROJECT The reference number of the Contract is - NWWDA/T/CW/002/2023-2024
ITT 2.3	The Information made available on competing firms is as follows: <u>N/A</u>
ITT 2.4	The firms that provided consulting services for the contract being tendered for are: <u>N/A</u>
ITT 3.1	Maximum number of members in the Joint Venture (JV) shall be: One
B. Contents of Tender Document	
8.1	(A) Pre-Tender conference “ <i>shall</i> ” take place. (B) A pre-arranged pretender visit of the site of the works “ <i>shall</i> ” take place at the following date, time and place: Office of the Chief Griftu town 13th September 2023 1000Hrs
ITT 8.2	The Tenderer will submit any questions in writing, to reach the Procuring Entity not later than N/A
ITT 8.4	The Procuring Entity’s website where Minutes of the pre-Tender meeting and the pre-arranged pretender site visit will be published is N/A
ITT 9.1	For Clarification of Tender purposes, for obtaining further information and for purchasing tender documents, the Procuring Entity’s address is: Northern Water Works Development Agency Street Address: Maji House, Kismayu Road City: Garissa ZIP Code: 70100 Country: KENYA info@nwwda.go.ke The request for clarifications should reach the procuring Entity not later 20th September 2023
C. Preparation of Tenders	
ITP 13.1 (h)	The Tenderer shall submit the following additional documents in its Tender: - Preliminary Evaluation MR 1- Copy of certificate of Registration/Incorporation MR 2 –Copy of Valid tax compliance Certificate MR 3 – Must fill Bill of quantities in format provided (incomplete BOQs will be rejected) MR 4- Must fill the form of tender in the format provided and signed by authorized person with power of attorney to commit the bid. MR 6- Must provide tender security (unconditional bank guarantee) of Ksh 1,000,000 valid 30 days beyond bid validity period

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	MR 7 – NCA 4 Water Works and above
ITT 15.1	Alternative Tenders “ <i>shall not be</i> ” _____ considered.
ITT 15.2	N/A
ITT 15.4	N/A
ITT 16.5	The prices quoted by the Tenderer shall be: “ <i>fixed</i> ”
ITT 20.1	The Tender validity period shall be 120 days.
ITT 20.3 (a)	(a) The delayed to exceeding 180 days . (b) The Tender price shall be adjusted by the following percentages of the tender price: (i) By 0% of the local currency portion of the Contract price adjusted to reflect local inflation during the period of extension, and (ii) By <u> N/A </u> % 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 “ <i>shall be</i> ” required. If a Tender Security shall be required, the amount and currency of the Tender Security shall be Kenya Shillings 1,000,000.00 valid 30 days beyond the bid validity period (unconditional bank guarantee)
ITT 21.2 (d)	The other Tender Security shall be N/A
ITT 21.5	N/A
ITT 22.1	In addition to the original of the Tender, the number of copies is: <u>One Original and One Copy</u>
ITT 22.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of: _____ Power of Attorney
D. Submission and Opening of Tenders	
ITT 24.1	(A) For <u>Tender submission purposes</u> only, the Procuring Entity’s address is: Northern Water Works Development Agency Street Address: Maji House, Kismayu Road City: Garissa ZIP Code: 70100 Country: KENYA Procurement Office, Ground Floor, Room A3 The deadline for Tender Submission is 26th September 2023 at 11.00 am.

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	Tenderer shall not have the option of submitting their Tenders Electronically
ITT 27.1	The Tender opening shall take place at the time and the address for Opening of Tenders provided below: Northern Water Works Development Agency, Po Box 495- 70100 Garissa, Maji House, Kismayu Road Conference room, 1st Floor. On 26th September 2023at 11,30 am
ITT 27.1	N/A
ITT 27.6	The number of representatives of the Procuring Entity to sign is Three (3) .
E. Evaluation, and Comparison of Tenders	
ITT 32.3	The adjustment shall be based on the “ <i>highest</i> ” 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.
ITT 35.2	The invitation to tender is extended to the following groups that qualify for Reservations N/A.
ITT 36.1	At this time, the Procuring Entity “ DOES NOT INTEND ” to execute certain specific parts of the Works by subcontractors selected in advance.
ITT 36.2	Contractor’s may propose subcontracting: Maximum percentage of subcontracting permitted is: 10 % of the total contract amount . Tenderers planning to subcontract more 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	The parts of the Works for which the Procuring Entity permits Tenderers to propose Specialized Subcontractors are designated as follows: _____ N/A For the above-designated parts of the Works that may require Specialized Subcontractors, the relevant qualifications of the proposed Specialized Subcontractors will be added to the qualifications of the Tenderer for the purpose of evaluation.
ITT 37.2 (d)	Additional requirements apply. These are detailed in the evaluation criteria in Section III, Evaluation and Qualification Criteria.
ITT 51.1	The person named to be appointed as Adjudicator is Eng. Isaac G. Wanjohi . The hourly fee for this proposed Adjudicator shall be: Ksh 25,000/=
ITT 52.2	Other documents required are N/A
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: Andrew Rage Eysimkele Title/position: Ag. Chief Executive Officer

ITT Reference	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	<p>Procuring Entity: <i>Northern Water Works Development Agency</i></p> <p>Email address: <i>info@nwwda.go.ke</i></p> <p>In summary, a Procurement-related Complaint may challenge any of the following:</p> <p>(i) the terms of the Tender Documents; and</p> <p>(ii) the Procuring Entity's decision to award the contract.</p>

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.

Prior to technical evaluation the tenderer shall be subjected to mandatory preliminary evaluation using the below listed criteria. The evaluation shall be on Responsive/Non Responsive criteria and a tenderer must pass all stated mandatory preliminary requirements in order to proceed to the next stage of technical evaluation. Any Non Responsive in any criteria shall result in overall FAIL.

MR	DESCRIPTION	Responsive/Non-Responsive
1	The Tender is signed and by the person with power of attorney, without material deviation, reservation, or omission.	
2	There is a letter granting power of attorney to sign the contract, if so required.	
3	Tenderer is a legally registered entity- copy of certificate of Registration/Incorporation	
4	If Tenderer is a JV, it is properly constituted.	
5	Valid Tax Compliance Certificate	
6	Must provide tender security(unconditional bank guarantee of Kshs	

	1,000,000 valid 30 days beyond bid validity period i.e 150 days	
7	A Tenderer has not participated in more than one Tender, except for permitted alternative tenders	
8	Tenderer has not been debarred by the PPRA or any other recognized institution.	
9	Tenderer is a commercially autonomous Kenyan State-owned Enterprise.	
10	Tenderer has no conflicts of interest.	
11	Tender has met all scope of requirements and specifications without any material deviation, reservation or omission	
12	The tenderer is not insolvent, in receivership, bankrupt or in the process of being wound up.	
13	The tender is valid for the required number of days.	
14	For Kenyan Tenderers, Tenderer is registered with appropriate authority (NCA 4Water Works and above).	

3. Tender Evaluation (ITT 35) Price evaluation: in addition to the criteria listed in ITT 35.2 (a) – (c) the following criteria shall apply:

i) **Alternative Completion Times**, if permitted under ITT 13.2, will be evaluated as follows:
N/A

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

iii) **Other Criteria**; if permitted under ITT 35.2(d):
N/A

4. Multiple Contracts

Multiple contracts will 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 tenderer 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 award (ITT 39), more specifically,

- a) In case the tender was subject to post-qualification, the contract shall be awarded to the lowest evaluated

- tenderer, subject to confirmation of pre-qualification data, if so required.
- b) In case the tender was not subject to post-qualification, the tender that has been determined to be the lowest evaluated tenderer shall be considered for contract award, subject to meeting each of the following conditions.
- i) The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow of Kenya Shillings **50,000,000**
 - ii) Minimum average annual construction turnover of Kenya Shillings **100,000,000**, equivalent calculated as total certified payments received for contracts in progress and/or completed within three *years*.
 - iii) At least one 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 **100, 000,000** equivalent.
 - iv) Contractor's Representative and Key Personnel, which are specified as, **below**

No.	Position	Minimum Qualifications	In Similar Works Experience (years)
1.	Contractor's Representative / Site Agent- One (1 Nr)	Degree in Civil Engineering or equivalent	7
2.	Surveyor- One (1 Nr)	• Diploma in Survey or equivalent	5
3.	General Foreman (1No)	• Diploma in Civil Engineering	10
4.	Plumber - One (1 Nr)	• Certificate in plumbing	5
5.	Drivers - 1 (1Nr)	• Driving License	5
6.	Mason - one (1Nr)	• Certificate in Masonry	5

CVs (including academic and professional certificates of proposed
The Bidder shall provide further details of proposed items of personnel using the relevant Form

- v) Contractors key equipment listed on the table below; -

No.	Equipment Type and Characteristics	Minimum Number required
1	Drilling Rig	One (1)
2	Test Pumping Unit	One (1)
3	Back hoe Excavator	One (1)
4	7 / 10 / 15-ton Tipper Lorry	One (1)
5	4WD Pick-Ups – 1 Ton	One (1)
6	Concrete Mixers (capacity 0.3m ³ to 1m ³), including batch weighing	One (1)
7	Concrete vibrator	One (1)

Documentary evidence through logo books containing tenderers name for owned equipment's/ or logo books containing lessee name for leased equipment's- certified by commissioner of oath
The Bidder shall provide further details of proposed items of equipment using the relevant Form

- 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 **three 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 **three 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	NWWDA Qualification Assessment- 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 2019	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 2019	Form CON – 2	
11	Financial Capabilities	<p>(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 50,000,000 equivalent for the subject contract(s) net of the Tenderer's other commitments.</p> <p>(ii) The Tenderers shall also demonstrate, to the satisfaction of the Procuring Entity, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.</p>	Form FIN – 3.1, with attachments	

1 Item No.	2 Qualification Subject	3 Qualification Requirement	4 Document To be Completed by Tenderer	5 NWWDA Qualification Assessment- met or Not Met)
		(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 <i>three</i> years- 2019,2020, 2021 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 100,000,000 equivalent calculated as total certified payments received for contracts in progress and/or completed within the last <i>three</i> years, divided by <i>three</i> 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 <i>three</i> years, starting 1st January 2020	Form EXP – 4.1	
	Specific Construction & Contract Management Experience	A minimum number of <i>one</i> similar contract specified below that have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor or sub-contractor between 1st January 2020 and tender submission deadline i.e. one contracts, each of minimum value Kenya shillings 100,000,000 equivalent. The similarity of the contracts shall be based on the following: <ol style="list-style-type: none"> 1. Drilling and construction of boreholes of at least 300m deep 2No./year; 2. Supply, laying and joining in trench of HDPE pipes of 63-110mm diameter of approximately 20km 3. Masonry work of at least 100m² per year 4. Fencing with concrete posts and chain-link 5. Supply and installation of Solar of at least 45kwatts/year 6. Supply and installation of 2No. Gensets of at least 60 KVA/year. 	Form EXP 4.2(a)	

1 Item No.	2 Qualification Subject	3 Qualification Requirement	4 <i>Document To be Completed by Tenderer</i>	5 <i>NWWDA Qualification Assessment- met or Not Met)</i>
		<i>The agency will verify the information, if found untrue, it will lead to disqualification of the bid</i>		

QUALIFICATION FORMS

1. FORMEQU: 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 <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

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

3. 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]: <i>[title of position from Form PER-1]</i>		
Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>	
Details	Address of 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
<i>[main project details]</i>	<i>[role and responsibilities on the project]</i>	<i>[time in role]</i>	<i>[describe the experience relevant to this position]</i>

Declaration

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

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

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

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

- a) be taken into consideration during 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: <i>[indicate country of Constitution]</i>
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 <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT 3.6 <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 3.5 <input type="checkbox"/> In case of state-owned enterprise or institution, in accordance with ITT 3.8, documents establishing: <ul style="list-style-type: none">• 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 <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 3.6. <input type="checkbox"/> 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			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.			
<input type="checkbox"/> Contract(s) not performed since 1 st 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			
<input type="checkbox"/> No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.			
<input type="checkbox"/> Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			

Year of 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			
<input type="checkbox"/> No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.			
<input type="checkbox"/> 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)
<i>[insert year]</i>	<i>[insert percentage]</i>	Contract Identification: <i>[indicate complete contract name, number, and any other identification]</i> Name of Procuring Entity: <i>[insert full name]</i> Address of Procuring Entity: <i>[insert street/city/country]</i> Matter in dispute: <i>[indicate main issues in dispute]</i> Party who initiated the dispute: <i>[indicate "Procuring Entity" or "Contractor"]</i> Reason(s) for Litigation and award decision <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

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)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITT 15 for the exchange rate

4.4.2 Sources of Finance

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

No.	Source of finance	Amount (Kenya Shilling equivalent)
1		
2		
3		

4.4.3 Financial documents

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

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

Attached are copies of financial statements¹ for the _____ years required above; and complying with the requirements

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

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
<i>[indicate year]</i>	<i>[insert amount and indicate currency]</i>		
Average Annual Construction Turnover *			

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

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 <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
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 Name² (as per ITT 34): _____

ITT No. and title: _____

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

1. Key Activity No One: _

Information				
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
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 – (bidder Letter head must)

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 and email of contact person.
6	Current Trade License Registration Number and Expiring date	
7	Name, country and full address (<i>postal and physical addresses, email, and telephone number</i>) 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 (<i>postal and physical addresses, email, and telephone number</i>) 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	Tenderer 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 or experience;
5. The Tenderer discloses that [check one of the following, as applicable]:
 - a) The Tenderer has arrived at the Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor;
 - b) the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this request for tenders, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements;
6. In particular, without limiting the generality of paragraphs (5)(a) or (5)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) methods, factors or formulas used to calculate prices;
 - c) the intention or decision to submit, or not to submit, a tender; or
 - d) the submission of a tender which does not meet the specifications of the request for Tenders; except as specifically disclosed pursuant to paragraph (5)(b) above;
7. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the works or services to which this request for tenders relates, except as specifically authorized by the procuring authority or as specifically disclosed pursuant to paragraph (5)(b) above;
8. the terms of the Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (5)(b) above.

Name _____ Title_ Date _____

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

C. SELF - DECLARATION FORMS

FORM SD1

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

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

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

..... (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 award¹ of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, 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 inspect² 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.

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 for Tenders No:

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that _____ (here in after called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here in after called" the Tender") for the execution of _____ under Request for Tenders No. _____ ("The ITT").
2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.
3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:
 - (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or
 - b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension there to 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 on or before that date.

[signature(s)]

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

FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee]

TENDER GUARANTEE No.: _____

1. Whereas [*Name of the tenderer*] (hereinafter called “the tenderer”) has submitted its tender dated [*Date of submission of tender*] for the [*Name and/or description of the tender*] (hereinafter called “the Tender”) for the execution of _____ under Request for Tenders No. _____ (“the ITT”).
2. KNOW ALL PEOPLE by these presents that WE of [**Name of Insurance Company**] having our registered office at (hereinafter called “the Guarantor”), are bound unto **Northern Water Works Development Agency** (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 _____ **2022** ___.

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]*

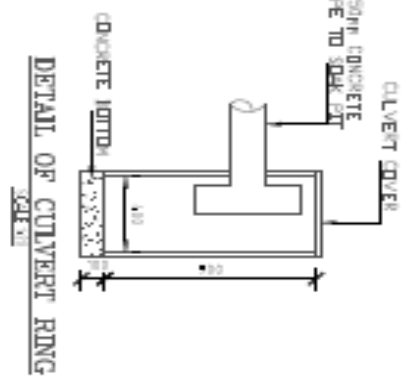
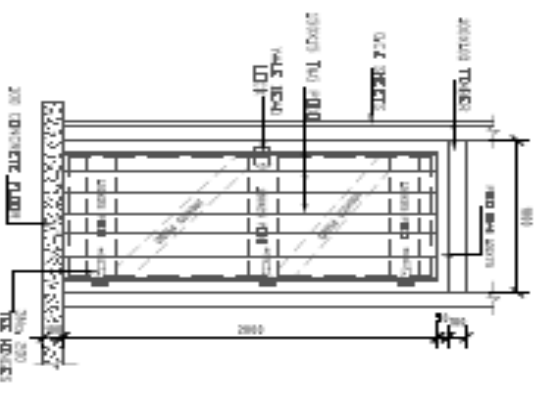
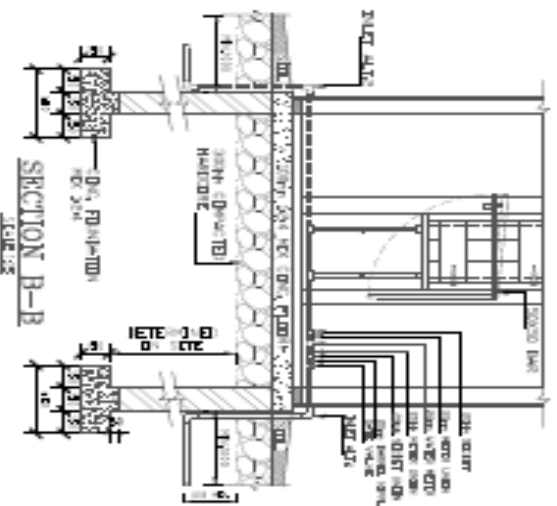
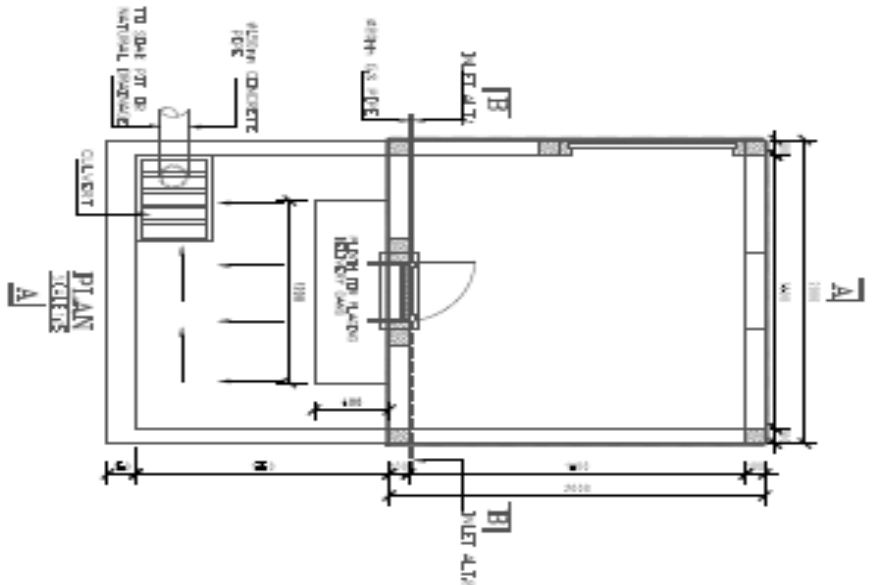
<i>Name of currency</i>	<i>Amounts payable</i>
Local currency: _____	
Foreign currency #1: _____	
Foreign currency #2: _____	
Foreign currency #3: _____	
Provisional sums expressed in local currency _____	[To be entered by the Procuring Entity]

PART II - WORK REQUIREMENTS

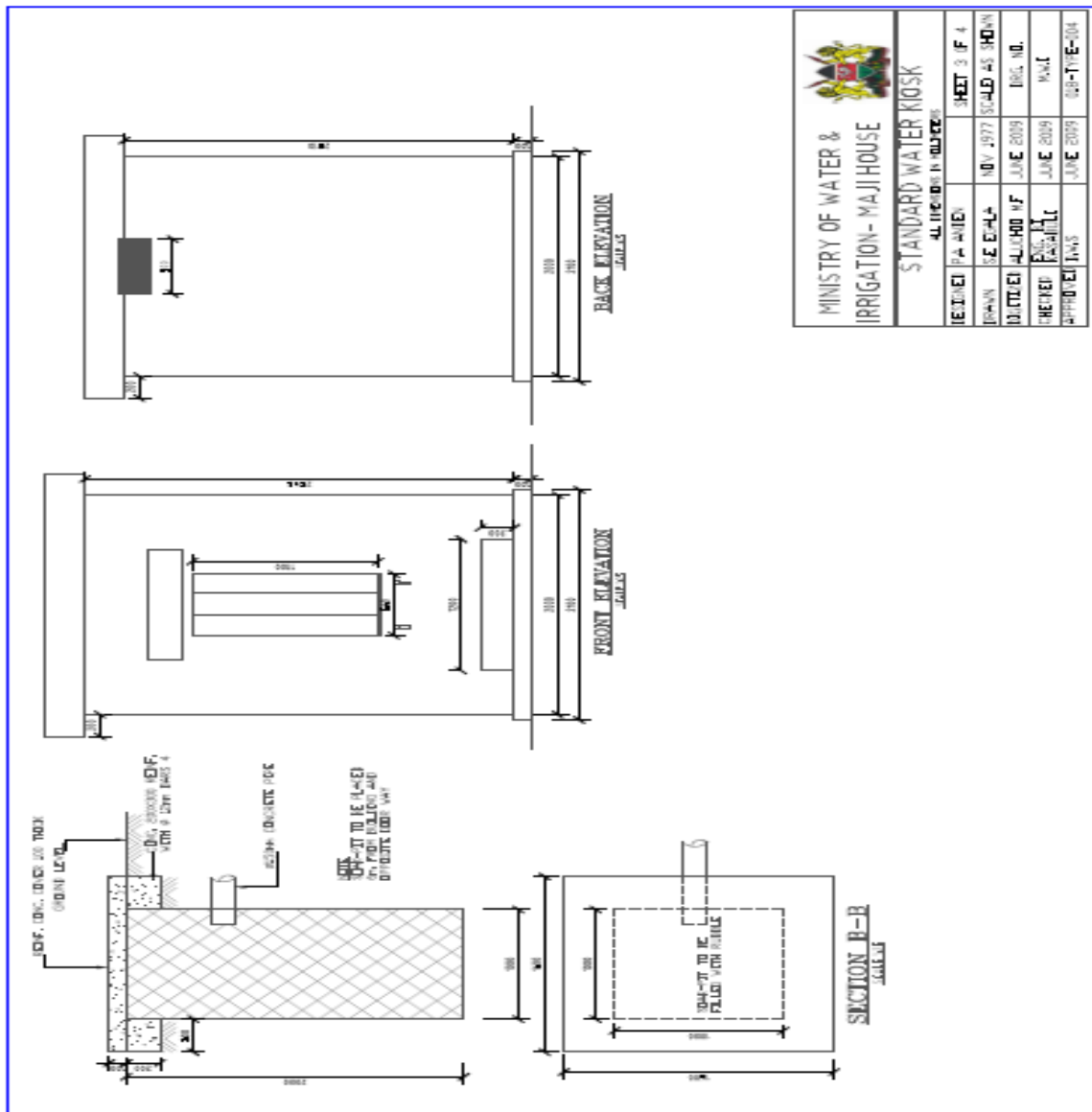


SECTION V - DRAWINGS

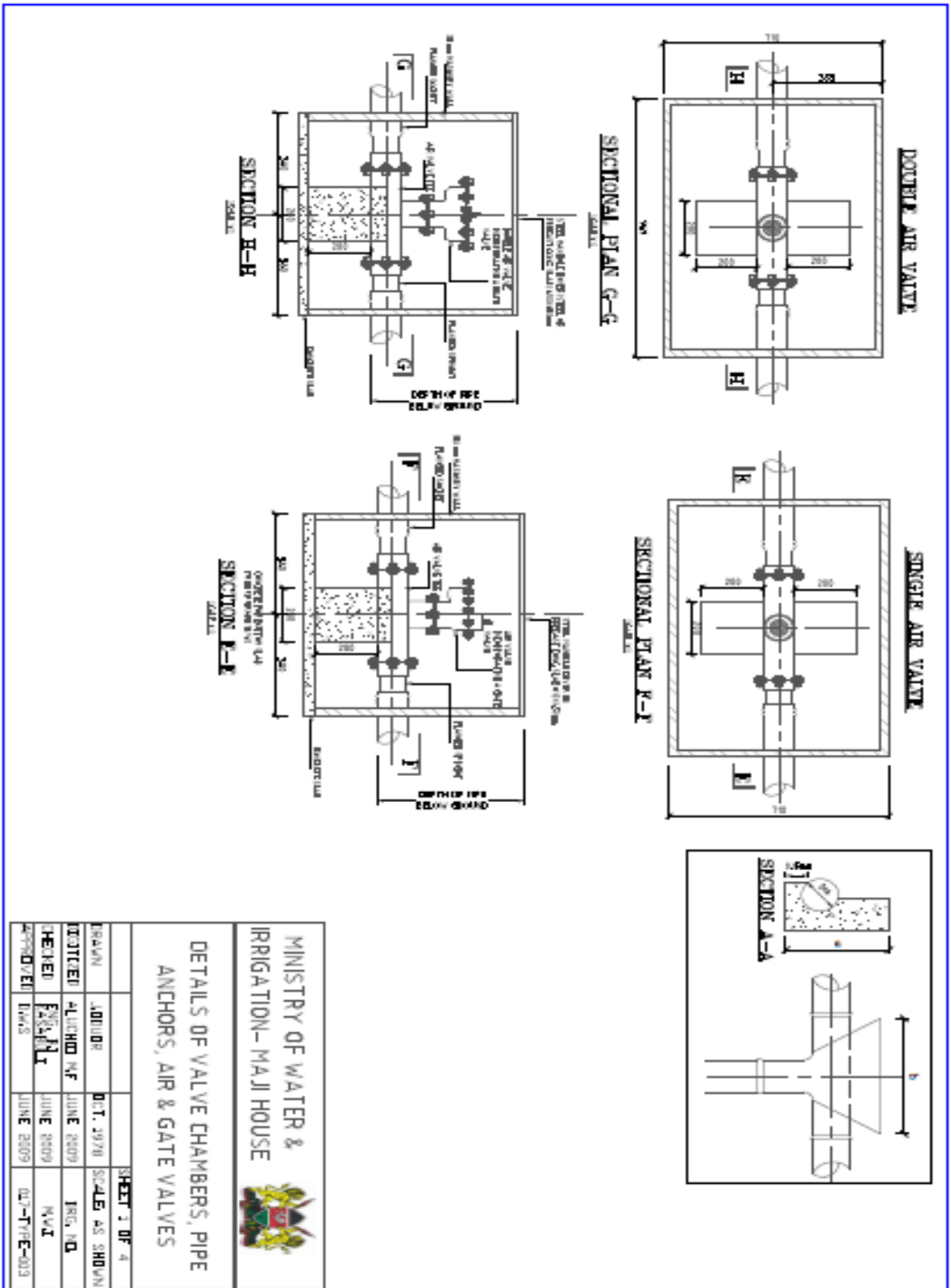
WATER KIOSK



MINISTRY OF WATER & IRRIGATION - MAJLI HOUSE 		
STANDARD WATER KIOSK AL-DIKRAN 31 AL-DIKRAN		
DESIGNED	P.A. ANEN	SHEET 1 OF 4
DRAWN	S.E. EGALA	NOV 1977 SCALE AS SHOWN
MODIFIED	A. ALIHOV M.F.	JUNE 2009 ENG. NO.
CHECKED	F. ALIHOV M.F.	JUNE 2009 M.A.C.
APPROVED	E.M.S.	JUNE 2009 QIP-TWE-024



CHAMBERS

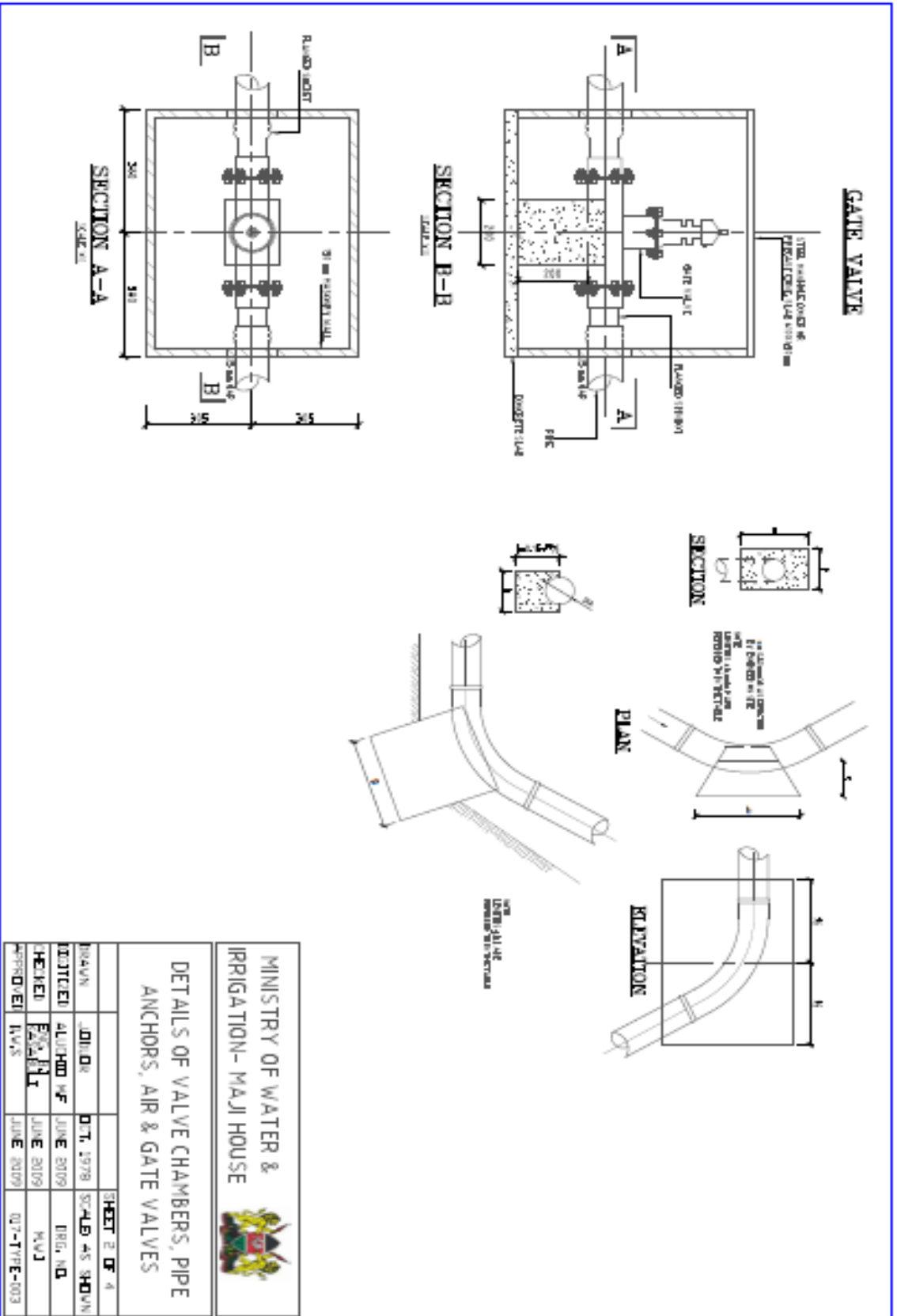


MINISTRY OF WATER &
IRRIGATION- MAJI HOUSE

DETAILS OF VALVE CHAMBERS, PIPE
ANCHORS, AIR & GATE VALVES



DRAWN		ADIBER	DATE	10/11/2009	SCALE	AS SHOWN
CHECKED		ALIMHO NJ	DATE	10/11/2009	IRG	NO
APPROVED		FAZAL M	DATE	10/11/2009	NAI	
DESIGNED		FAZAL M	DATE	10/11/2009	DT-TRC-003	



MINISTRY OF WATER &
IRRIGATION- MAJI HOUSE



DETAILS OF VALVE CHAMBERS, PIPE
ANCHORS, AIR & GATE VALVES

DESIGN	JULIUS	DT. 1978	SHEET 2 OF 4
DESIGNED	ALUHHO W.F	JUNE 2009	ALB-45 SHOWN
HECKED	ELIASHI	JUNE 2009	IRIG. NO.
APPROVED	IVAS	JUNE 2009	MAJ
			017-TYPE-103

MARKER POSTS

LETTERING ON INDICATOR MARKERS SHALL BE BY WHITE PAINT

LETTERING GROOVE

DETAILS OF LETTERING
SCALE: 1:1

NOTE: PAINTED BLUE WITH WHITE LETTERS

INDICATOR POSTS FOR PIPELINE, SECTION VALVES, AIR VALVES & WASH OUT

MINISTRY OF WATER & IRRIGATION - MAJI HOUSE

INDICATOR POSTS FOR PIPELINE MARKERS

DESIGNED	P. AL. NADHJI	MAY 1977	SHEET 1 OF 1
TRACKED	N.K. KADJI	MAY 1977	SCALE: AS SHOWN
DISTRICTED	J.G. MAHDI	APRIL 2016	
CHECKED	ENG. B.I. KASHALI	APRIL 2016	
APPROVED	D.W.S	APRIL 2016	DWG. No. MW/06-TPR-001

SECTION VI - SPECIFICATIONS

Notes for preparing Specifications

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

GENERAL

101	Tender Drawings, Bills of Quantities and Specifications.....	5
102	Setting out of the works.....	5
103	Contractor's Working Area/Boundaries of Works.....	6
104	Flagging, Lighting, Watching and Traffic Control.....	6
105	Restrictions on Use of Roads.....	6
106	Offices for Engineer's Representative.....	7
107	Contractor's Offices, Yard, Stores, etc.....	7
108	Accommodation for Workmen.....	7
109	First Aid Outfits, Medical Treatment and Transport.....	7
110	Water and Electricity Supplies.....	7
111	Precautions against contamination of the works.....	8
112	Level Datum.....	8
113	Levels and Dimensions.....	8
114	Survey Equipment and Labour.....	8
115	Order of Construction of Works.....	8
116	Quality of Materials and Workmanship.....	9
117	Submission of Samples.....	9
118	Responsibility for Ordering Materials and Manufactured Articles and Samples for Testing...9	
119	Testing of Materials.....	9
120	Rejected Materials.....	10
121	Cutting out existing work.....	10
122	Existing services.....	10
123	Temporary Removal of Existing services.....	11
124	Permanent Diversion of Existing services.....	11
125	Permanent Support for Existing Services, etc.....	11
126	Attendance upon other contractor.....	11
127	Supports to excavations.....	11
128	Ownership of Excavated and other material.....	12
129	Care of Boundary Hedges, Walls, Fences and Trees.....	12
130	Work through private property and serving notices.....	13
131	Compensation for loss of crops etc. in private property.....	13
132	Provision of facilities for Engineer's inspection.....	13
133	Inspections by Engineers During period of Maintenance.....	13
134	Clearing up site.....	13
135	The lands under the control of the contractor.....	14
136	Fencing the works.....	14
137	Correspondence and records to be in English Language.....	14
138	Materials ordered and paid for by the Employer.....	15
139	Testing of Water-Retaining Structures.....	16
140	Clearing and Sterilizing Water-retaining structure.....	16
141	Water etc. for testing water-retaining structure.....	17
142	Contractor to use special plant if required.....	17

143	Use of parts of the works on their completion.....	17
144	Duty staff.....	17
145	Regulations and site Discipline.....	17
146	Removal of Employees.....	17
147	Record of names and Permanent Address of Employer.....	18
148	Fire precautions.....	18
149	Tests	on
	completion.....	18
150	Connection	of Existing
	main.....	18
151	Responsibility	for
	damage.....	18
152	Safety precautions to be observed.....	19
153	Opening and reinstatement of surfaces.....	19

GENERAL

101. TENDER DRAWINGS, BILLS OF QUANTITIES AND SPECIFICATION

101.1 The Tender Drawings are as listed in Section VI of Volume I and these may be supplemented from time to time by the Engineer during the period of the contract.

101.2 The Specifications, Bills of Quantities, and the Tender Drawings are intended to describe and provide for a complete and finished project. They are intended to be co-operative, e.g. all items of work called for by any shall be as binding as if called for by all. The Contractor is to understand that the work herein described shall be complete in every detail, notwithstanding the fact that every item necessarily involved is not particularly mentioned or shown. The Contractor will be held to provide all labour and materials necessary for the completion of the works described and shall not avail himself of any errors or omissions which are manifestly unintentional.

101.3 Before commencing any work, the Contractor shall check all drawings, Bills of Quantities and Specifications and report to the Engineer any errors or inconsistencies and shall verify all dimensions given on the drawings

101.4 The Specifications are divided into trades and divisions for the distinct purpose of facilitating the work. However, the Contractor will become responsible for furnishing all labour and materials necessary to provide the complete project as contemplated by the drawings and specifications. Any item mentioned under any heading of the Specifications must be supplied even though it is not called for again under the heading for the respective work.

101.5 At the award of contract the contractor shall sign one set of drawings and specifications and such signed set of contract documents shall be deposited with the Engineer as an additional evidence of the Contractor's understanding of the work required.

102 SETTING OUT OF THE WORKS

102.1 The Engineer's Representative will if necessary provide the Contractor with basic information supplementary to that shown on the Drawings such as the position of centre-lines and base-lines etc. Such supplementary information may be provided on drawings sketches in writing or indicated on the site.

102.2 The contractor shall prepare detailed setting out drawings and data sheets as necessary and submit them to the Engineer's Representative in triplicate for approval. Any modification to the setting out drawings or data sheets required by the Engineer's Representative shall be made by the Contractor and re-submitted for final approval. Approval by the Engineer's

Representative shall be signified by the return to the Contractor of one copy duly signed by the former or an authorized member of his staff.

102.3 Should it be necessary during setting out or during construction for agreed setting out details to be amended to contractor shall amend the drawings or data sheets or make new ones for approval as required by the Engineer's Representative.

102.4 Copies of setting out drawings and data sheets shall be preserved for use by the Contractor in preparing final records and drawings in accordance with the requirements set out elsewhere.

102.5 The Contractor shall be before commencing work establish steel datum pegs at all sites which shall be securely concreted in and shall agree with the Engineer the level and co-ordinates of each peg.

103 CONTRACTOR'S WORKING AREA/BOUNDARIES OF WORKS.

103.1 The contractor shall make his own arrangements for and pay all costs incurred in the use of such areas of land as he may require for storage and working space for the purpose of the contract.

103.2 The employer will provide the land and rights of way for works specified in the contract.

103.3 The contractor shall not enter upon or occupy with men tools equipment and materials any land other than land or rights of way provided by the Employer without the written consent of the owner of such additional land or rights of way as he may require in accordance with conditions of contract.

104 FLAGGING LIGHTING WATCHING AND TRAFFIC CONTROL

104.1 The Contractor shall be responsible for watching and lighting the works and for the flagging and control of traffic and he shall comply with the requirements of the Employer and police and the competent Authority in these matters.

105 REGISTRATIONS ON USE OF ROADS.

105.1 The Contractor shall not run tracked vehicles or tracked plant on any existing works of the Employer or on any public or private road being a metallic or sealed road or on any public or private road being a metallic or sealed road or on any other public or private road without the written approval of the Engineer and the responsible Authority or Owner and subject to such conditions as each may require.

105.2 The Contractor shall observe all weight restrictions which apply automatically to the majority of minor roads and tracks in Kenya when such road and tracks are wet and with all other reasonable restrictions which may from time to time be imposed by the Engineer and the responsible Authority or Owner.

105.3 Contractor shall not be entitled to additional payment for any additional cost he may incur on account of adverse weather and road conditions, restrictions on the use of the roads delays detours or any other thing which may increase the average haulage distance or journey time or otherwise adversely affect his operations.

106. OFFICE FOR ENGINEER'S REPRESENTATIVE

106.1 The Engineer's Representative shall be responsible for provision of his own furnished office accommodation for the entire duration of his supervision contract. No costs in this respect shall be borne by the Contractor.

107 CONTRACTOR'S OFFICES, YARDS, STORES, ETC.

107.1 The contractor shall provide and maintain at a place to be agreed with the Engineer's Representative an office for the use of his Agent and to which written instructions by the Engineer's Representative can be delivered. Any instructions delivered to such office shall be deemed to have been delivered to the Contractor. This office will be erected before any construction work commences and will be open and attended at all hours when work is in progress.

107.2 The Contractor shall make his own arrangements for all yards stores etc. and for all services in connection therewith for the efficient execution of the Contract.

107.3 The location of all offices and stores shall be agreed before hand with the Engineer and shall be such as to avoid obstruction and nuisance to the public and interference with the proper operation of the existing services.

108 ACCOMMODATION FOR WORKMEN

108.1 The contractor shall provide at each site sufficient closets or latrines to the satisfaction of the Government Medical Officer. They shall be properly screened and maintained in a clean and sanitary state at all times.

109 FIRST AID OUTFITS MEDICAL TREATMENT AND TRANSPORT

109.1 During the progress of the works the Contractor shall provide and maintain to the satisfaction of the Medical Officer of Health in easily accessible positions on the Site adequate First Aid Outfits to the approval of the Medical Officer of Health and of the Engineer, such outfits to be in charge of an experienced dresser who shall be on duty at the Site during working hours.

110 WATER AND ELECTRICITY SUPPLIES

110.1 The Contractor shall make his own arrangements for water and electricity supplies and shall pay all constructional costs, fees and expenses incurred and for all the water and electricity used.

111. PRECAUTIONS AGAINST CONTAMINATION OF THE WORKS

111.1 The Contractor shall ensure that all his personnel working on the site are medically suitable to be in contract with a public water supply and his personnel shall undergo any necessary medical test at the Contractor's expense to show that they are free from infectious diseases and are not carriers of any such diseases.

111.2 The Contractor shall at all times take every possible precaution against contamination of the works and existing Water Mains. The Contractor shall give strict instructions to all persons employed by him to use the sanitary accommodation provided. Clause 16 of the Conditions of Contract will be rigidly enforced in any case where these instructions are disobeyed.

111.3 Throughout the Contract the Site and all permanent and temporary works shall be kept in a clean tidy and sanitary condition.

112 LEVEL DATUM

112.1 All levels are referred to survey of Kenya datum and the Contractor shall obtain in writing from the Engineer's Representative the location and value of the permanent bench marks to be used.

113. LEVELS AND DIMENSIONS

113.1 The reduced levels shown on the Drawings are believed but not guaranteed to be correct. In the event of any discrepancies between the Drawings and Specification, the Specification shall have precedence over the Drawings. In the event of any discrepancies between Drawings the Contractor shall notify the Engineer in writing who will issue corrections, forthwith.

114. SURVEY EQUIPMENT AND LABOUR

114.1 The Contractor shall maintain the Engineer's Representative survey instruments and other equipment necessary for inspection/checking of Works for the entire duration of the contract (A bill item has been included for the procurement)

114.2 The Contractor shall provide all labour and materials as may be required by the Engineer's Representative for survey work in connection with the works.

115. ORDER OF CONSTRUCTION OF WORKS

115.1 Construction of the Works shall be carried out as directed by the Engineer.

115.2 Following detailed discussions with the Engineer, and before he begins the work, the Contractor shall submit to the Engineer a programme which shall be reviewed and brought up to date at frequent intervals as the work proceeds. The programme shall be adhered to and only varied by permission of the Engineer.

116. QUALITY OF MATERIALS AND WORKMANSHIP

116.1 All materials and workmanship shall be to the approval of the Engineer. In the reading of this Specification the words "to the approval of the Engineer" shall be deemed to be included in the description of all materials or articles incorporated in the Works and in the descriptions of the operation for the due execution of the works.

116.2 Specifications of the British Standards Institution current at the date of tender shall apply for all materials and workmanship unless otherwise directed by the Engineer.

116.3 The words "British Standards Specifications" are hereinafter abbreviated to B.S.

117. SUBMISSION OF SAMPLES

117.1 Before incorporating in the finished work any material or articles which he supplies under the terms of the Contract the Contractor shall submit to the Engineer's Representative for his approval a sample of each respective material or article and such samples shall be delivered to and be kept at his office for reference. All the respective kinds of material and articles used in and upon the Works shall be at least equal in quality to the approved samples. Each and every sample shall be a fair average of the bulk material or of the article which it represents. The Engineers Representative may decide the method by which each sample to be taken from the bulk shall be obtained.

118. RESPONSIBILITY FOR ORDERING MATERIALS AND MANUFACTURED ARTICLES AND SAMPLES FOR TESTING.

118.1 The responsibility for so ordering and delivering materials and manufactured articles and samples that they may be tested sufficiently far in advance of the work as not to delay it shall rest upon the Contractor and he shall not be entitled to any time credit for delays occasioned by his neglect to order sufficiently well in advance or to payment of any costs he may incur as the result thereof.

119 TESTING OF MATERIALS

119.1 Tests and inspections will be carried out by the Engineer or by an Inspector to be appointed by him. In such circumstances where the Engineer does not require witnessed tests to be carried out, the Contractor shall furnish test certificates.

119.2 The contractor shall provide facilities for the Engineer or his Agent to inspect examine and test all materials and workmanship. If the materials are manufactured on premises other than those of the Contractor, he shall obtain from the manufacturer similar facilities.

119.3 The Contractor shall give two weeks notice to the Engineer of the place or places at which the materials are to be manufactured and as to when testing will be in progress and shall ascertain before manufacture commences whether the Engineer wishes to attend or send his Agent for the purposes of witnessing manufacture, inspecting, examining, or testing.

120 REJECTED MATERIALS

120.1 Should any materials or manufactured articles be brought on to the Site of the Works which are in the judgment of the Engineer unsound or of inferior quality or in any way unsuited for the work in which it is proposed to employ them, such materials or manufactured articles shall not be used upon the Works but shall forthwith be removed from the Site of the Works all at the Contractor's expense and in each case as the Engineer and/or Engineer's Representative shall decide and direct.

121 CUTTING OUT EXISTING WORK

121.1 Where existing work is to be cut, the Contractor shall ensure that the cutting out is done in such manner as not to cause permanent damage to the surrounding structure. Before commencing to cut out any work, the Contractor shall submit to the Engineer the method he proposes to use and no such work will be permitted until the Engineer's written approval has been obtained.

121.2 Notwithstanding the giving of the Engineer's approval, the Contractor shall be liable for making good at his own expense any damage arising from such work of cutting out.

122 EXISTING SERVICES

122.1 The Contractor shall take every precaution to ensure that all existing services pipes cables drainage and irrigation ditches and the like are located supported and safeguarded from damage even though they may not be in the line of excavation but near to it. Any damage caused to any such services pipes culverts cables drainage and irrigation ditches and the like attributable to the Contractor's operations or to his negligence shall be made good by or for the Contractor at his own expense or the satisfaction of the Engineer and of the owner or responsible Authority.

122.2 In the event of the owner or responsible Authority electing to repair such damage the Contractor shall pay the cost of his or their so doing the work. Should the Contractor fail to pay the cost of the said work within a reasonable period of the account being presented the Employer reserves the right to settle the account and deduct the sum paid by him from moneys

due or which may become due to the Contractor.

123 TEMPORARY REMOVAL OF EXISTING SERVICES

123.1 If it should become necessary for the proper execution of the work temporarily to remove or divert any existing pipe sewer field-drain cable drainage or irrigation ditch or other service the Contractor shall obtain permission from the competent

Authority or Owner and shall carry out the work at his own expense in a manner and at times to be approved by such Authority or owner and shall subsequently reinstate the work to the satisfaction of such Authority or Owner. In the event of the Owner or responsible Authority electing to arrange for the temporary removal of an existing service the Contractor shall pay the cost of his or their doing the work. Should the Contractor fail to pay the cost of the said work within a reasonable period of the account being presented the Employer reserves the right to settle the account and deduct the sum paid by him from moneys due or which may become due to the Contractor.

123.2 The Contractor's attention is particularly drawn to the requirement to maintain drainage and irrigation ditches in order to avoid any interruption of flow of water therein to the satisfaction of the Engineer Owner or competent Authority and the Contractor shall be deemed to have included in his rates and prices for all temporary works so required.

124 PERMANENT DIVERSION OF EXISTING SERVICES

124.1 If in the opinion of the Engineer and/or of the competent Authority or owner it should become necessary permanently to remove or re-align any existing pipe sewer field-drain cable ditch or other service the Contractor shall obtain permission where necessary from the competent Authority or Owner and shall carry out and complete the work to the satisfaction of the Engineer and such Authority or Owner. Payment for such additional work will be made in accordance with the tendered rates and/or the schedule for day work contained in the Bill of Quantities as the Engineer will determine provided always that the necessity for such permanent diversion has not arisen due to the fault of the contractor.

124.2 In the event of the Owner or responsible Authority electing to arrange for the permanent diversion of an existing service due to the fault of the contractor doing the work. Should the Contractor fail to pay the cost of the said work within a reasonable period of the account being presented the Employer reserves the right to settle the account and deduct the sum paid by him from monies due or which may become due to the Contractor.

125 PERMANENT SUPPORT FOR EXISTING SERVICES, ETC.

125.1 If in the opinion of the Engineer and/or the competent Authority or owner it should become necessary to provide permanent support for any existing pipe sewer cable structure or other thing disturbed exposed or injured during or after the execution of the works the Contractor shall carry out promptly such additional works as the Engineer may require to provide such permanent support. Payment for such additional work will be made in accordance with the tendered rates and/or the schedule for Day work contained in the Bill of Quantities as the Engineer will determine provided always that the necessity for such permanent support has not arisen due to the fault of the Contractor.

126 ATTENDANCE UPON OTHER CONTRACTORS

126.1 When an item is included in the Bill of Quantities for attendance, such attendance shall in addition to the requirements of the conditions of contract include all reasonable and customary conveniences apparatus plant and labour in attendance.

127 SUPPORT TO EXCAVATIONS

127.1 Payment for timber and other supports left in excavations will be made only for those supports ordered to be left in for any purpose by the Engineer. Supports so left in will be paid for at the rates entered in the Bill of Quantities.

128 OWNERSHIP OF EXCAVATED AND OTHER MATERIAL

128.1 All material of any kind whatsoever including growing matter removed or cut down as part of the works shall remain the property of the Employer or the owner of the land through under or over which the works are carried out. The disposal of such material belonging to the Employer shall be at the discretion of the Engineer who will instruct the Contractor in all matters of its use and/or removal from the site.

129 CARE OF BOUNDARY HEDGES, WALLS, FENCES AND TREES

129.1 The Contractor shall not cut through or remove any section of any boundary, hedge, wall, or fence without the prior approval of the Engineer's Representative who will determine the limits of such cutting or removal.

129.2 Approval for the cutting or removal of boundary hedges walls and fences will normally be limited to those crossing the route of mains and pipelines and the contractor shall so conduct his operations as to minimize the extent of such cutting through or removal.

129.3 In the case of boundary hedges walls and fences being part of enclosed paddocks or grazing areas the Contractor shall provide erect maintain and remove on completion of all work adequate temporary fencing or shall by other means ensure that animals and other livestock cannot stray from the previously enclosed paddocks or grazing areas.

129.4 The Contractor shall repair and reinstate in a manner similar to the original or by other approved means any hedging wall or fence which he may have cut through or remove with or without the approval of the Engineer's Representative or damaged during his operations and all such repairs and reinstatement shall be the contractor's sole liability and shall be carried out to the satisfaction of the Engineer and the responsible Authority or owner.

129.5 The Contractor shall not cut down grub up or remove any tree without the prior permission of the Engineer.

130 WORK THROUGH PRIVATE PROPERTY AND SERVING OF NOTICES

130.1 Where the work is to be executed in private land the Employer will be responsible for negotiating and obtaining rights of way and the serving of all notices as may be required upon the Owners and/or Occupiers of the land and it shall be the obligation of the Contractor to keep the Employer and the Engineer fully informed concerning the rate of contract progress and of his intention to enter and begin work within any way leave as required by Clause 201 and 202 of this Specification.

131 COMPENSATION FOR LOSS OF CROPS ETC. IN PRIVATE PROPERTY

131.1 The attention of the Contractor is drawn to Clause 11 of the conditions of contract and with reference to sub-clause 11(1) of the clause the description "loss of or damage to property" shall mean crops including trees, shrubs and hedges within the boundaries of the lands and rights of way defined in this Specification except such individual trees shrubs and hedges which the Engineer may require to be preserved in accordance with Clause 292 of this Specification.

132 PROVISION OF FACILITIES FOR ENGINEER'S INSPECTIONS

132.1 The Contractor shall provide the necessary equipment access and labour to enable the

Engineer and/or the Engineer's Representative to conveniently carry out such inspections as they may deem necessary at all times during the currency of the contract.

133 INSPECTIONS BY ENGINEER DURING PERIOD OF MAINTENANCE

133.1 The Engineer will give the Contractor due notice of his intention to carry out any inspections during the period of Maintenance 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 take note of all matters and things to which his attention is directed by the Engineer.

134 CLEARING UP SITE

134.1 During the progress of the works the contractor shall at reasonable intervals or when required by the Engineer's Representative gather and remove rubbish and surplus materials from the site.

134.2 On completion of the works the site of all permanent and temporary works in connection with the contract shall be carefully cleared up and everything shall be handed over to the Employer in a neat and clean condition.

134.3 All rubbish roots undergrowth and the like cleared from the works must be burnt or removed completely from the site and disposed of by other means to the satisfaction of the Engineer and the Contractor shall make his own arrangements for all such disposal.

134.4 All surplus materials and manufactured articles supplied by the contractor shall if not accepted or purchased by the Employer be removed from the site and disposed of by the contractor.

135 THE LANDS UNDER THE CONTROL OF THE CONTRACTOR

135.1 The Contractor shall attend to all operations carried out on the lands under his control and utilize them only for the purpose of construction of the works and to the lands responsible for any damage to the lands responsible for any damage to the lands and to the lands adjacent. Before starting any work the Contractor shall ascertain the boundaries of the lands coming under his control.

136 FENCING THE WORKS

136.1 The Contractor shall fence the works in a manner sufficient for the protection of the public and of livestock and property to whomsoever it may belong during the progress of the works and shall satisfy the Employer and the Engineer or his Representative in this respect.

136.2 Temporary fencing shall prevent the straying of livestock and reasonable access to lands and premises must be provided.

136.3 The Contractor shall erect and maintain guard-rails around all trenches and other open excavations in a manner sufficient to provide safety for pedestrians and vehicles at all time.

136.4 Temporary bridges shall be provided across trenches to maintain reasonable access for pedestrians and vehicles to land and property on either side of the trench.

137 CORRESPONDENCE AND RECORDS TO BE IN THE ENGLISH LANGUAGE

137.1 All correspondence between the contractor and the Engineer or the Engineer's staff shall be in the English language.

137.2 All books, time sheet records, notes, drawings, documents shall be in the English Language, or, if the original documents are in another language, a certified translation in English shall be submitted to the Engineer or Engineer's Representative.

138 MATERIALS ORDERED AND PAID FOR BY THE EMPLOYER

138.1 The Employer will deliver to the Contractor at the specified places the materials detailed (but not by way of limitation) in the Appendix to the Bill of Quantities and any other materials of which the Engineer may from time to time give particulars to the contractor. Payment for all such materials delivered to those places and store areas has been or will be made by the Employer to the several manufacturers forwarding agents and shipping companies and the Contractor will not be allowed commission on any such payments.

138.2 The Contractor shall take delivery of all materials without delay upon receipt of instructions from the Engineer's Representative giving details of the materials and the places at which delivery is to be taken.

138.3 The Employer will make every endeavor promptly to supply any materials which he may undertake to supply in accordance with the Conditions but he will accept no responsibility for loss delay or inconvenience suffered by the Contractor should such materials not be available and/or delay occur in the supply of such materials and plant.

138.4 The Contractor shall examine the materials before taking delivery and shall report any damage defect or deficiency to the Engineer's Representative immediately.

Any damage defect or deficiency so reported or which arises after the contractor has taken delivery and could not reasonably have been detected by normal methods of inspection shall be repaired or made good at the expense of the Employer provided always the Engineer is satisfied that such damage defect or deficiency has not been caused by negligence on the part of the contractor.

138.5 Subject to the above provisions whilst taking delivery of and after taking delivery of all materials by the Employer and Contractor shall be solely responsible for any loss, damage, defect or deficiency however arising in connection therewith and he shall forthwith make good such loss, damage, defect or deficiency at his own expense.

138.6 After taking delivery of the materials the Contractor shall transport them without delay to his own store on the site of the works or elsewhere. The contractor will be held solely responsible for any claim against the Employer and any delay brought about by the Contractor's failure to take delivery immediately he is instructed to do so and the settlement of any such claims shall be at the Contractor's sole expense.

138.7 In pricing the items in the Bill of Quantities for "Take delivery" the Contractor shall include (but not by way of limitation) for the following services and supplies:-

- (a) Accept, unpack, physically inspect, and test as may be necessary, re-pack as required report discrepancies and breakages, cart to storage compound and/or stores building and conduct all insurances claims.
- (b) Store the materials and plant and maintain a Stores Ledger recording in full detail both the receipt and disposal of all items.
- (c) Guard and insure all such material and plant against all loss or damage.

138.8 Where materials are supplied by the Employer the quantity incorporated in the Works will be checked against the quantity supplied. The Contractor shall at his own expense return all surplus material to the Employer's store and make good any deficiencies. In checking pipes an allowance of not more than one per cent of the measured quantity used will be made to cover

cutting to waste except in special circumstances which shall be decided by the Engineer.

139 TESTING OF WATER-RETAINING STRUCTURES

139.1 All water-retaining structures shall be tested for water tightness on completion in the following manner. The structure shall be filled with clean water in stages and held at each water level for such time as the Engineer may require. Should any dampness or leakage occur at any stage the water shall be drawn off and the defects remedied to the satisfaction of the Engineer. The procedure shall be continued and finally the structure shall be allowed to remain full for seven days. Should any damages or leakages or other defects occur they shall be made good to the satisfaction of the Engineer and the structure re-tested until the water tightness is approved by the Engineer.

139.2 The Contractor shall provide a hook gauge to measure variations in water level during the tests.

139.3 The testing shall be carried out before excavations are backfilled and embankments placed.

140. CLEANSING AND STERILIZING WATER-RETAINING STRUCTURE

140.1 The inside of all potable water-retaining structure and all interior pipe work and fittings shall be thoroughly cleaned and washed after the water tightness test has been approved by the Engineer to remove all contamination and the water from these operations shall be removed by squeegees and drained away.

140.2 The structure shall then be filled to overflow level with clean water clean water containing 20 parts per million of chlorine and left for a period of at least 24 hours. The chlorinated water shall then be drained away and the structure refilled with clean water from which samples shall be taken for analysis to the instruction of the Engineer. If any of the results of the analyses are unsatisfactory when compared with those of the control sample of the supply water the sterilizing process shall be repeated until the results of the test are satisfactory.

140.3 The costs of the initial sampling analysis and preparing reports on the bacteriological quality of the water shall be borne by the Employer but should the initial reports be unsatisfactory the costs of any subsequent sampling analyses preparing reports shall be borne by the Contractor.

141 WATER ETC. FOR TESTING WATER-RETAINING STRUCTURES

141.1 The Contractor shall make available all water required for the testing of water-retaining structures. The Employer may allow the Contractor to draw water for testing from the existing water supply at the price pertaining at the time.

141.2 The Contractor shall be solely responsible for the provision of all labour materials and other things necessary for testing water-retaining structures.

141.3 The Contractor shall be responsible for making all arrangements necessary for obtaining all water required for testing water-retaining structures.

142 CONTRACTOR TO USE SPECIAL PLANT IF REQUIRED

142.1 The Contractor shall if the Engineer so requires supply and use such special plant and tools in executing the work as the Engineer may direct.

143 USE OF PARTS OF THE WORKS ON THEIR COMPLETION

143.1 Should the Employer so desire he shall have full power to use and put into active operation any or all sections or parts of the works directly they are finished. Such action shall

not however relieve the Contractor of his obligations with regard to maintenance.

144 DUTY STAFF

144.1 At least one responsible senior representative shall be on the site and immediately available at all times during normal working hours. To such representative shall be delegated full authority to confer with the Engineer's Representative or his staff and to take all steps and to issue all those instructions which may be required in an emergency to ensure the safety of all personnel of the works and of all the Employer's and other property on the Site and in the immediate vicinity thereof. The Engineer's Representative may from time to time at his discretion after taking into consideration all the prevailing conditions allow some relaxation of this clause but such relaxation shall be made only with his written permission and subject to any special conditions which he may then require.

145 REGULATIONS AND SITE DISCIPLINE

145.1 The Contractor shall obey all police health and municipal regulations all other regulation which may from time to time require his observance and he shall instruct his agents servants and other employees to obey such regulations. The Contractor shall be responsible for keeping discipline on the Site and shall permanently remove from site within 24 hours from receipt of written instructions by the Engineer to that affect any servant laborer or other employee who neglects to observe the regulations or who refuses to carry out instructions given to him by the Contractor on the representation of any responsible representative of the Employer.

146 REMOVAL OF EMPLOYEES

146.1 The contractor shall permanently remove from site any person guilty of attempted dishonesty to the Employer or of disobedience of the regulations aforesaid or of bad behavior of who causes or attempts to cause trouble and unrest among the labour force.

147 RECORD OF NAMES AND PERMANENT ADDRESSES OF EMPLOYEES

147.1 The Contractor shall keep a full record giving the names and permanent addresses of all his employees and holds this record for the inspection of the Engineer.

148 FIRE PRECAUTIONS

148.1 The Contractor shall provide at the Site adequate audible means of giving the alarm in the event of an outbreak of fire and shall make arrangements which may be necessary for the sounding of such an alarm. The Contractor shall take all precautions against fire and he shall provide fire fighting appliances labour, pangas, beaters, axes etcetera as may be necessary for the isolation and extinguishing of fires with the utmost expediency.

149 TESTS ON COMPLETION

140.1 On commissioning of the works the contractor shall have on site personnel to ensure that all the plant is working satisfactorily. The personnel shall be on site for a minimum period of 7 days or for such time as is required to determine that the equipment is operating to the satisfaction of the Engineer.

150 CONNECTION INTO EXISTING MAIN

150.1 Connection into existing mains will be carried out at times acceptable to the Employer such that any inconvenience to the public is kept to a minimum. This may require night or Sunday working and the contractor must allow for this in his rates. The contractor shall notify the Engineer at least seven days before the day on which the particular connection is proposed.

The Engineer will make any necessary arrangement for the limited shut down of the mains, provided that times proposed are acceptable.

151 RESPONSIBILITY FOR DAMAGE

151.1 The Contractor shall be fully responsible for any damage which may be done by himself or his employees to site buildings, works services such as electricity, water, gas, pipelines, or apparatus. Such damage must be made good to the entire satisfaction of the Engineer within a reasonable period of time specified in writing by the Engineer.

151.2 The Contractor shall be fully responsible for and take every reasonable precaution to protect any section of the contract works against loss or damage from any cause.

152 SAFETY PRECAUTIONS TO BE OBSERVED

152.1 The Contractor shall be responsible for the safety of his own staff and his sub-contractors staff whilst employed on the site.

152.2 The Contractor shall see that only safe working practices are used, and that only proper and safe equipment such as step ladders, ladders, scaffolding, ropes, and lifting equipment are in use on the site. The Contractor shall ensure that his staff are suitably instructed to use only safe working methods and safe appliances during the receipt, unloading, handling into store and transmission to site, erection and installation, testing and commissioning, the equipment, materials and installation forming the requirements of this contract.

152.3 The Engineer will require cessation of any working practice which in the Engineer's opinion is not safe and the removal of any equipment which has not been certified as safe by an appropriate authority.

153 OPENING AND REINSTATEMENT OF SURFACES

153.1 The Contractor shall ascertain and observe the current regulations of the Highway Authority and the requirements of any other body public or private person in, on, under, over or through whose land the works are to be carried out for the opening and reinstatement of surfaces and it will be deemed that he has ascertained all charges and requirements connected therewith and has made full allowance in his prices therefore.

153.2 All surfaces of roads fields open spaces paths courtyards gardens verges and other places whether public or private which are affected by the operations of the contractor are to be reinstated by him both temporarily and permanently unless in the case of surfaces in the control of the Highway Authority or a public body such Authority or body shall elect to do the permanent reinstatement themselves when the Contractor shall do the Temporary reinstatement only.

SECTION 2

G. EARTHWORKS

201	Conditions of Site.....	21
202	Site Clearance.....	21
203	Ground Levels.....	22
204	Trial Hole.....	22
205	Excavation Generally.....	22
206	Excavation in Excess.....	23
207	Mechanical Excavation.....	23
208	Restoration of Borrow Areas Spoil Tips and Quarries.....	24

209	Headings.....	24
210	Excavation for Foundations, Thrust and Anchor Blocks.....	24
211	Excavation in Rock.....	25
212	Keeping Rock Faces Dry.....	25
213	Cleaning Rock Surfaces.....	25
214	Explosives.....	26
215	Excavated Materials suitable for re-use.....	26
216	Refilling of excavations.....	26
217	Hard Filling.....	27
218	Refilling of Pipe Trenches.....	27
219	Making good subsidence after re-filling.....	27
220	Removal of Timber from Excavations.....	28
221	Reinstatement of Surfaces.....	28
222	Forming Banks and Filled Areas.....	28
223	Planting.....	29
224	Disposal of Surplus Excavated Material.....	29
225	Free Draining Fill.....	30
226	Graded Gravel for Drains.....	30
227	Rock Pitching.....	31
228	Formation of Footpaths.....	31
229	Concrete Paving Slab Lining to Ponds.....	31
230	Reinstatement of Trench Surfaces in Roads.....	31

201 CONDITION OF SITE

201.1 Before carrying out any work on any site the site shall be inspected in conjunction with the Engineer's Representative to establish its general condition which shall be agreed and recorded in writing.

201.2 Details recorded shall include the location of all boundary and survey beacons the condition of buildings surfaces terracing (if any) ditches watercourses roads tracks fences and other information relating to the site and elsewhere which may be affected by the Contractor's operations.

201.3 In the case of way leaves for mains and pipelines the boundaries of the way leaves will be defined by the Employer and the contractor shall provide erect and maintain in position from commencement to final completion of all work and all reinstatement in every section substantial timber stakes or similar approved markers not less than 1.5m high indicating the position of every beacon at 100m or such other intervals as the Engineer's Representative may require. Payment for this work will be made at the tendered rate.

201.4 In the event of any boundary or survey beacon being disturbed or displaced as a result of the Contractor's operations the Contractor shall forthwith at his own expense replace the beacon and shall employ the services of an approved licensed survey for this purpose.

202 SITE CLEARANCE

202.1 Before beginning excavation or other work on any site the areas to be occupied by the permanent works shall be cleared of all trees stumps bushes and other vegetation and all roots shall be grubbed out. The felling and disposal of trees other than coffee trees exceeding 1000mm. girth at a height of 1.0m above ground level shall be measured separately and paid for in accordance with the tendered rates.

202.2 All debris shall be burnt or removed and disposed of by other means to the satisfaction of the Engineer.

202.3 The limits of the areas to be cleared shall be as indicated on the drawings or as will be defined by the Engineer.

202.4 In the case of way leaves for cables, mains, pipelines and the like the area to be cleared shall extend over the full width of the way leaves but the Contractor shall preserve as far as practicable all grass and other vegetation outside the limits of trenches and permanent works within the way leaves and shall not unnecessarily destroy crops, coffee trees and the like the removal of which is not essential to his operations.

202.5 The Engineer may require that individual trees shrubs and hedges are to be preserved and the Contractor shall take all necessary precautions to prevent their damage. In the case of trees etc. which the Engineer requires to be preserved the cutting or grubbing out and disposal of roots encountered within the net dimensions of any excavation or the minimum required width of any trench shall be paid for in accordance with the Schedule for day work contained in the Bill of quantities.

202.6 Before beginning clearance within any way leaves the Contractor shall give seven days written notice of his intention to the Engineer who will determine the extent and limits of such clearance having regard to the Contractor's requirements the rate of Contract progress the reasonable wishes of owners and occupiers weather conditions and other factors which in the opinion of the Engineer may affect or be affected by the Contractor's proposals.

202.7 The Contractor shall take particular 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 seem to him to warrant.

203 GROUND LEVELS

203.1 Following the completion of site clearance and before the commencement of any earthworks the sites shall be surveyed in conjunction with the Engineer's Representative to establish existing ground levels and these agreed ground levels shall form the basis for the calculation of quantities of any subsequent excavation and filling.

204 TRIAL HOLES

204.1 The contractor shall excavate refill and restore in advance of his programme all such trial holes as he may require for the location of water and other mains cables rock etc. The cost of these trial holes shall be included in his excavation rates.

205 EXCAVATION GENERALLY

205.1 Excavation 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 the minimum of infilling will afterwards be necessary.

205.2 It shall be the Contractor's responsibility at all times to ensure the stability and safety of excavations and the Contractor shall take all measures necessary to ensure that no collapse or subsidence occurs.

205.3 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 wailings poling boards sheeting bracing and the like. All supports shall be of sound design and construction and shall be sufficiently watertight to permit excavation concreting and other work to be completed satisfactorily.

205.4 Excavations shall be kept free from water and it shall be the Contractor's responsibility to construct and maintain temporary diversions and drainage works and to carry out pumping

and to take all measures necessary to comply with this requirement.

205.5 In the event of soft or otherwise unsuitable ground being encountered at formation level in any excavation the Contractor shall forthwith inform the Engineer's Representative and shall excavate to such extra depth and refill with compacted granular or other approved fill or Class '10' concrete as the Engineer may require. Payment for such additional excavation and additional refilling will be made at the tendered rates provided always that the formation has not become soft or otherwise unsuitable due to the fault of the Contractor. The requirements of this paragraph shall apply also to the side face of any excavation with which concrete or other work will be in contact except that in the case of a side face the Engineer may alternatively require that the net dimensions of the concrete or work shall be increased.

206 EXCAVATION IN EXCESS

206.1 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 Class 10 concrete or compacted granular or other approved fill to the original formation level and/or dimensions at the Contractor's expense as the Engineer may require.

207 MECHANICAL EXCAVATION

207.1 A mechanical excavator shall be employed by the Contractor only if the subsoil is suitable and will allow the timbering of the trenches or other excavations to be kept sufficiently close up to ensure that no slips falls or disturbance of the ground take place or there are no pipes cables mains or other services or property which may be disturbed or damaged by its use.

207.2 When mechanical excavations are used a sufficient depth of materials shall be left over the bottom of the excavations to ensure that the ground at formation level is not damaged or disturbed in any way. The excavation shall then be completed to formation level by hand.

208 RESTORATION OF BORROW AREAS SPOIL TIPS AND QUARRIES

208.1 Any quarries or other borrow areas developed by the Contractor for the soil purpose of the works shall be finished to safe and fair slopes to the approval of the Engineer. Where directed by the Engineer areas shall be re-soiled with at least 100 mm of topsoil and grassed. The cost of such work shall be included in the Contractor's prices.

209 HEADINGS

209.1 The excavations for all pipelines pumping mains and works mains are to be made in open-cutting unless the permission of the Engineer for the ground to be tunneled is given in writing or a heading is shown on the Drawings. If the Contractor applies to the Engineer for permission to use headings and if this is given there shall be no additional cost whatsoever to the Employer.

209.2 Where a heading is specified or shown on the drawings or permitted to be used it shall be constructed 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 Class '15' concrete.

After the pipe has been laid, jointed and tested the heading shall be filled in short lengths not exceeding 1 metre with Class '15' or '10' displacer concrete as directed. Great care shall be taken to ensure that the heading is completely filled with concrete and hard filling shall 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. The Contractor shall allow for leaving in all timbering. The Contractor shall be responsible for the proper restoration of any road surfaces, pipes, cables or other things or property that may be damaged.

210 EXCAVATION FOR FOUNDATIONS THRUST AND ANCHOR BLOCKS

210.1 Excavations for foundations and for thrust and anchor blocks shall be to such depths as the Engineer may direct and no concrete or other material shall be placed until the formation has been examined and approved. Due notice shall be given to the Engineer's Representative to enable him to examine the formation well in advance.

210.2 The Engineer may direct that a layer of excavation of not less than 75mm thickness shall be left undisturbed and subsequently taken out by hand immediately before concrete or other material is placed. Similarly where concrete or other material is to be placed in contact with the side face of an excavation the Engineer may direct that the final 75mm thickness of the excavation to that face shall be left undisturbed and subsequently taken out neatly to profile by hand.

210.3 Areas of excavation which are to receive a layer of site concrete as a screed under the structural concrete shall be covered with the screed immediately the excavation has been completed.

210.4 If in the opinion of the Engineer due to the fault of the Contractor the ground becomes weathered prior to the placing of concrete or other material the Contractor shall excavate the weathered soil and replace it with Class '10' concrete to the original formation level at his own expense.

211 EXCAVATION IN ROCK

211.1 Rock will be defined as follows for the purposes of payment:-

Solid ledge or bed rock which cannot be removed without systematic drilling and blasting or barring and wedging, conglomerate deposits which are firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and blasting or barring and wedging; boulders exceeding 0.3 cubic metres in volume.

211.2 No excavation in materials which can be excavated by the use of pick and shovel will be considered or paid for as rock excavation

211.3 The breaking of concrete or road surface or road base will not be considered or paid for as rock excavation.

211.4 The Engineer's decision as to the necessity or otherwise of rock excavating methods or appliances shall be final.

212 KEEPING ROCK FACES DRY

212.1 The contractor shall keep free of running water pools the surfaces of rock upon or against which concrete is to be deposited and no concrete shall be placed until surfaces of the rock are properly drained. Special precautions are to be taken to prevent running water from washing out cement or concrete while it is setting or in any other way from injuring the Works. Drains and pipes shall be provided in or behind concrete as may be necessary for the temporary conveyance of water and shall afterwards be grouted up and such laying and grouting shall be at the Contractor's cost.

213 CLEANING ROCK SURFACES

213.1 The faces and surfaces of all rock against which concrete is to be placed shall after being excavated to the required limits be properly cleaned and left free from all dust loose pieces of rock mud dirt and other loose material and they shall be perfectly clean when the concrete is deposited.

214 EXPLOSIVES

214.1 Should the Contractor wish to transport or use explosives on or in connection with the Works he shall comply with the Explosives Laws of Kenya. The Contractor shall provide a special proper store for explosives in accordance with local regulations and shall provide experienced men for handling explosives to the satisfaction of the Engineer and the Authorities concerned.

214.2 Blasting shall only be carried out on these sections of the Works for which permission in writing shall have been given by the Engineer's Representative and shall be restricted to such hours and conditions as he may prescribe. Such permission shall not be withheld nor such hours and conditions imposed unreasonably.

214.3 The greatest care shall be taken in the use of explosives the charges being so placed and of such amount as in no way to weaken existing structures or the foundations or ground adjacent to the existing and proposed works. The Contractor shall take all necessary precautions to prevent loss injury or accident to persons or property and shall be entirely liable for any accident or damage that may result from the use of explosive.

215 EXCAVATED MATERIALS SUITABLE FOR RE-USE

215.1 In so far as they may be suitable and comply with the specification materials arising from excavations may be used in the works.

215.2 The Contractor in excavating shall ensure that all materials suitable for re-use are kept separate and set aside and protected as necessary to prevent loss or deterioration.

215.3 The materials forming the surface and foundations of roads tracks and footways shall when excavated and if required for further use be carefully separated all hard materials being kept free from soil or other excavated materials.

215.4 Paving slabs bricks and similar surfaces shall be carefully removed and stacked. Prior to the commencement of excavation the number of badly broken and unusable paving slabs bricks etc. on the line or the excavation shall be agreed with the Engineer's Representative and only the cost of replacing these shall be paid as an extra to the Contractor.

215.5 In verges and other grass surfaces the grass and top soil shall be stripped and separately stacked.

215.6 In particular the Contractor in excavating 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 and the Contractor shall not be entitled to payment for screening or transport as provided for in Clause 218 of this specification if this requirement is not complied with

216 REFILLING OF EXCAVATIONS

216.1 All refilling of excavations and trenches shall be thoroughly compacted in layers not exceeding 150mm. compacted thickness and by means which will not damage the works.

217 HARD FILLING

217.1 Hard filling shall consist of approved clean mixed ballast, broken stone, and/or concrete. All the materials shall be broken so as to pass through 75 mm. internal diameter rings and be evenly graded between that size and 3 mm. mesh size thereby enabling them when thoroughly compacted to form a hard solid mass. Filling shall be free from all earth clay vegetable or other organic matter shall contain no broken plaster lime mortar or other rubbish. It shall be laid in 300mm. layers each layer being properly spread and thoroughly compacted

with rollers and/or rammers.

218 REFILLING OF PIPE TRENCHES

218.1 Filling around and for 300mm over the top of the pipe shall be completed by hand using approved hand rammers and suitable material obtained from excavations. Materials for such refilling shall be free from stones greater than 25mm. and to the approval of the Engineer.

218.2 If the quantity of suitable material is insufficient the Contractor shall either screen the excavated soil to exclude stones and other materials likely to damage the pipes or transport suitable material from other excavations or borrow pits as the Engineer may require. The cost of such work shall be paid for at tendered rates provided always that the Contractor has complied with the requirements of Clause 215 of this specification

218.3 Filling around and for 300 mm over the top of pipes shall be carried out with the utmost care special attention being paid to joint holes so as to obtain the greatest possible compactness and solidity.

218.4 The remainder of the trench may be filled in with selected approved filling by hand or alternatively mechanical equipment if approved by the Engineer. Hand rammers and mechanical equipment shall be to the approval of the Engineer.

219 MAKING GOOD SUBSIDENCES AFTER REFILLING

219.1 All refilling whether over foundations or in pipe trenches shall be thoroughly compacted by ramming and any subsidence due to consolidation shall be made up by the Contractor at his own expense with extra compacted material. Should subsidence occur after any temporary or permanent surface reinstatement has been completed the surface reinstatement shall first be removed the hollows made up and then the surface reinstatement re-laid.

220 REMOVAL OF TIMBER FROM EXCAVATIONS

220.1 Timbering shall be removed from the excavations before or during the process of refilling 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 excavations which event the Contractor shall leave in the excavations such timber as he considers necessary to prevent damage the proper repair or which the Contractor shall be solely responsible for in the event of any such damage occurring.

220.2 Except as provided for below no extra payment will be made for timber left in excavations and the Contractor will be deemed to have allowed for this contingency in pricing his Tender. The Engineer will however certify for payment in respect of such timber does not arise from any negligence of the Contractor.

221 REINSTATEMENT OF SURFACES

221.1 All surfaces whether public or private who are affected by the works shall be reinstated temporarily by the Contractor in the first instance and in due course when the ground has consolidated fully he shall reinstate the surfaces permanently.

221.2 The temporary reinstatement and maintenance and permanent reinstatement and maintenance of all surfaces of roads streets paths fields, verges gardens and any other surfaces which have been affected by the operations of the Contractor shall be his sole liability and shall be carried out to the satisfaction of the Engineer and of the responsible authority.

221.3 Temporary reinstatement shall be carried out immediately the trenches are refilled.

221.4 Permanent reinstatement shall not be carried out until the ground has consolidated completely and the Contractor shall apply to the Engineer for permission to carry out this work in the event of further settlement occurring after the completion of the permanent reinstatement and during the currency of the Contract the Contractor shall forthwith make good the reinstatement to the approval of the Engineer or responsible authority.

221.5 For the purposes of temporary and permanent reinstatement roads tracks and footpaths 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.

221.6 Materials forming the surface and foundations of roads, tracks and footways (Clause 215) may if they are approved by the Engineer be used by the Contractor in the temporary reinstatement of surfaces. The contractor shall provide additional materials necessary for the reinstatement.

221.7 In verges and other grass surfaces and after the refilling has been thoroughly consolidated the topsoil shall be re-laid rolled planted with grass as may be necessary watered and attended until the grass has become well established. Should the grass fail it shall be replanted as required until a satisfactory growth is obtained.

221.8 Trenches in fields and gardens shall be reinstated to the condition in which the field or garden was before excavation was commenced. The final surface of the trench shall be flush with the surrounding ground.

221.9 The Contractor shall take all necessary precautions to ensure that no toxic materials which may cause damage to vegetation or livestock or pollute streams or watercourses are used in any temporary or permanent reinstatement and shall indemnify the Employer against any claims arising out of the use of such materials.

221.10 If at any time any trench becomes dangerous the Engineer shall be at liberty to call on the Contractor to restore it to the proper condition at 3 hour's notice.

221.11 If the work of reinstatement as carried out by the Contractor is not to the satisfaction of the Engineer and/or the responsible authority and should the Contractor not remedy the defect forthwith any remedial work considered necessary may be undertaken by the Employer and/or the responsible authority at the Contractor's expense.

222 FORMING BANKS AND FILLED AREAS

222.1 The Engineer shall mark Banks and filled areas.

222.2 Before any filling is started the ground on which embankments are to be sited shall be stripped of all grass and topsoil and all roots vegetable matter and other unsuitable substance removed.

222.3 The filling to be used in the embankments and filled areas shall be selected material approved by the Engineer's Representative from that arising surplus from excavation, the material being placed according to its nature as shall be directed, that is, coarse hard material may be placed at the bottom with the fine material and/or soil placed at the top or at the surface.

222.4 The filling shall be placed in layers not exceeding 150mm thick each layer being thoroughly compacted by an approved vibratory roller to the satisfaction of the Engineer. Each layer of fill shall be compacted to an average of 95% of Proctor Maximum Dry Density.

222.5 Where water has to be added to achieve the optimum moisture content it shall be applied in an even manner. The rate of application shall be such that no transverse or longitudinal flow occurs. The previously compacted surface shall be prevented from drying out by watering prior to placing of next layer.

222.6 Where directed by the Engineer that rock shall be used as filling to Embankments, the rock shall be placed in the bottom of the embankment or as directed by the Engineer's Representative. The largest portions of the rock shall be placed in layers the maximum depth of which shall be 0.5m, the interstices filled with the finer material and the whole layer compacted by an approved method.

More fine material shall be added and the layer again compacted until the voids are completely filled.

222.7 All earth moving, placing of fill material, watering, borrowing, and compacting shall be carried out as separate operations to give a clear and controlled method of working.

223 SOILING

222.8 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 filth. The Contractor shall supply approved material for this purpose.

224 PLANTING

224.1 Surface required to be grassed except verges and other grass surfaces for which the Contractor is responsible in accordance with Clause 221 shall be planted with approved local grass at a spacing of 200m x 200 mm. The grassed areas 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.

224.2 The soiling and planting of the grass in sloped 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

225 DISPOSAL OF SURPLUS EXCAVATED MATERIAL

225.1 All surplus excavated material shall be disposed of to tips to the approval of the Engineer.

225.2 The cost of disposing of surplus excavated material included any specified soiling and grassing shall be allowed for in the rates for excavation.

226 FREE DRAINAGE FILL

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

227 GRADED GRAVEL FOR DRAINS

227.1 Graded gravel surround to drains shall be clean washed stone or crushed hard rock graded between 20 mm and 5 mm or as specified in the BoQs.

228 ROCK PITCHING

228.1 Rock pitching shall consist of a free draining mixture of broken hard stone obtained from quarries approved by the Engineer which shall have a maximum size of 3000 mm and

which shall not contain more than 5% by weight of material which will pass a 10mm B.S. sieve. Between these limits the material shall be reasonably well graded so as to form a free draining blanket without large voids.

229 FORMATION OF FOOTPATHS

229.1 The ground footpaths shall be trimmed to formation level and 50 mm thick precast concrete slabs shall be bedded on 50mm thick layer of fine sand.

230 REINSTATEMENT OF TRENCH SURFACES IN ROADS

230.1 Materials for both temporary and permanent reinstatement of trenches in road verges, tracks and unmade roads shall be excavated material selected to form a surface similar to the adjoining surface. The surface shall be well compacted.

230.2 Temporary reinstatement of trenches in surfaced roads shall comprise a layer of compacted hardcore, of minimum thickness 150 mm, topped with a 75 mm layer of surface material taken from the original surface material taken from the original surface together with any additional material to form a satisfactory running surface. The surface shall be well rolled and sealed with a coat of approved cold applied bituminous emulsion, applied with an approved sprayer at the rate of about 2 litres/m². The emulsion shall be blinded immediately with quarry dust or sand approved by the Engineer's Representative and then rolled with an 8 ton roller.

230.3 The quality and grade of bitumen shall be suitable for the climatic conditions of the area and shall otherwise conform to BS 434.

230.4 Permanent reinstatement of surfaced roads shall be carried out to the approval of the competent Authority but shall in no way be inferior to that specified elsewhere in the Specification for base of wearing courses to road works. In all cases, the top layer of the temporary reinstatement shall be removed to expose the compacted hardcore which shall be topped up and re-rolled as necessary.

SECTION 3

CONCRETE

INDEX

301	GENERAL.....	36
302	CONCRETE.....	37
302.1	Requirements.....	38
302.2	Strength.....	39
302.3	Mixes.....	41
302.4	Quality Control.....	42
302.5	Production.....	43
302.6	Cement.....	44
302.7	Aggregates.....	45
302.8	Water.....	47
302.9	Admixtures.....	47
303	REINFORCEMENT.....	47
303.1	Steel.....	47
303.2	Storage.....	48
303.3	Bending and Fixing.....	48
303.4	Couplers for Reinforcement.....	49

304	SHUTTERING.....	50
304.1	Requirements.....	50
304.2	Sawn.....	51
304.3	Wrought.....	52
304.4	Special Wrought.....	52
304.5	Tolerances.....	52
304.6	Striking and Removal.....	53
305	CONCRETING.....	54
305.1	Requirements.....	54
305.2	Transporting.....	54
305.3	Placing and Compaction.....	55
305.4	Cold Weather.....	58
305.5	Hot Weather.....	59
305.6	Wet Weather.....	60
305.7	Holes, Cavities and Fixings.....	60
305.8	Protection and Curing.....	61
305.9	Joints.....	64
305.10	Finishes.....	68
305.11	Surface Finishes.....	68
305.12	Making good.....	69
305.13	Removal and Replacement.....	69
306	TESTING.....	69
306.1	Sampling and Testing.....	69
306.2	Loading Tests.....	70
307	SPECIAL CONCRETE.....	71
307.1	No-Fines.....	71
307.2	Air-Entrained.....	71
307.3	Benching.....	72
307.4	Ready Mix.....	72
307.5	Granolithic.....	72
307.6	Pneumatically Applied Mortar (Gunite).....	72
307.7	Pumped Concrete.....	74
308	PRECAST CONCRETE.....	74
308.1	Requirements.....	74
308.2	Weir Blocks and Sills.....	75
308.3	Coping Blocks and Weir Blade Holders.....	75
308.4	Kerbs.....	75
308.5	Pavin Slabs.....	76
308.6	Other Blocks.....	76
308.7	Wall Units.....	76
308.8	Other Items.....	76
309	SITE BOOKS AND STANDARDS.....	76
309.1	Instructions to be recorded.....	76
309.2	Site Diary.....	76
309.3	Copies of Standards and Codes.....	77

310	WATER RETAINING STRUCTURES-SPECIAL	
	CLAUSES.....	77
310.1	Making good.....	77
310.2	Construction Joints in Water Retaining Structures.....	77
310.3	Water tightness of Structures.....	77
3A.1	TESTING OF WATER-RETAINING STRUCTURES.....	78
3A2	CLEANSING AND STERILIZING WATER-RETAINING STRUCTURES.....	78
	TABLES.....	79
3.8	Sampling, Testing and Acceptance Standards.....	80
301	GENERAL	
301.1	The standard of materials and of workmanship shall not be inferior to the recommendations of the current:	
(a)	British Standard Code of Practice CP114-) The Structural Use of Reinforced) whichever is Concrete in Buildings and CP110 – The) applicable Structural Use of Concrete.) to the Or) particular (b) British Standard Code of Practice BS 5337) structures The Structural Use of Concrete for) Retaining Aqueous Liquids) and) (c) Appropriate British Standards or) (d) Approved Kenya Bureau of Standards or Ministry of Works Standards, if any. Or) (e) Other equivalent and approved international standards.	
	The requirements outlined in the above documents must be read with those of this Section of the Specification and where any conflict exists between the recommendations of the above and of this Specification, the requirements of this Specification shall prevail.	
301.2	As and when required by the Engineer the Contractor shall prepare and submit, before commencing the work, a time-chart (additional to the general programme) detailing the various operations for concrete work.	
301.3	No material shall be used in the Works until prior approval for its use has been given by the Engineer; neither shall any change in the nature, quality, kind, type, source of supply or manufacture be made without the Engineer’s permission.	
301.4	Names of manufacturers and test certificates for materials not supplied by the Employer shall be supplied as soon as possible to the Engineer.	
301.5	The cost of providing samples and the cost of carrying out tests required by 306.1 (except as otherwise provided in the Conditions of Contract) together with the cost of supplying	

equipment for sampling and site testing indicated in columns 3 and 4 of Table 3.7 of this section of the Specification shall be borne by the Contractor (see also Clause 306.1)

301.6 During the progress of the Works, consignment notes for materials not supplied by the Employer shall be supplied to the Engineer giving details of each consignment.

301.7 The use of the word “approved” in this Specification refers to the approval of the Engineer.

301.8 Cross references between certain Clauses of this Specification have been shown in brackets following particular item.

302 CONCRETE

302.1 Requirements

302.1.1 The mix proportions shall be selected to ensure that the workability of the fresh concrete is suitable for the conditions of handling and placing, having regard to the structural element being constructed, the disposition of reinforcement, the climatic conditions prevailing and the limitations set by Table 3.1 of this Clause for the particular class of concrete specified.

302.1.2 Notwithstanding the strength requirements of this Specification, in order to ensure adequate durability of the finished concrete, while at the same time limiting its shrinkage characteristics, the limits shown in Table 3.1 shall not be exceeded.

302.1.3 In all cases of mix proportioning, the added water shall be included with due allowance for the moisture contained in the aggregates and shall be the minimum consistent with the workability requirements. Where difficulty is experienced in maintaining the correct workability for the water-cement ratio outlined in Table 3.1 the use of a water reducing additive may be permitted subject to Clause 302.9

302.1.4 Where aggregates do not conform to the moisture requirements of Clause 21.2 of BS 5337 but are permitted for use, in the case of liquid retaining structures the water content indicated in Table 3.1 shall be reduced by 2.5 litres per 50 kg of cement.

Type of Structures (Cl.49 BS 5337)	Exposure Minimum Cement Content Kg/m ³ finished Concrete
---------------------------------------	--

OPC
Sulphate Resisting cement

Aggregate
W/C
Aggregate
W/C

40 mm
20 mm
40 mm 20 mm

Liquid Retaining Surface Structures

A

320

360

0.50

As for Ordinary Portland Cement (OPC)

Liquid Retaining Substructures Building Foundations

B

260

290

0.55

Protected Building Structures*

C

220

250

0.60

Type of Structure

Exposure to Sulphate Condition

Minimum Cement Content Kg/m³ finished concrete

O P C

Sulphate Resisting Cement

Total 50% 3 Parts per

100 000 in ground water

Aggregate

W/C Aggregate

W/C

40 mm 20 mm

40 mm 20 mm

Substructures

And

Foundations <0.2

<30 240 280 0.55 - - -

0.2-0.5

30-120 290 330 0.5 240 280 0.55

0.5-2.0

250-500 - - - 290 330 0.5

1.0-2.0

250-500 - - - 330 370 0.45

>2.0 >500 - - - Ditto with

Protective coating

*Not exposed to liquid or moist or corrosive conditions

302.2 Strength

302.2.1 The basis for assessing the strength of concrete shall be related to the characteristic strength, defined as the strength of the concrete at 28 days, as determined by the standard method of testing (Clause 306.1) below which not more than 5% of the test results shall fall.

302.2.2 The relationship between the class of the concrete and the characteristic strength shall accord with Table 3.2

TABLE 3.2 : Concrete Strength Requirements

Size (mm)	Location	Coarse Aggregate
28 Days	Class and Characteristic Strength	N/mm ²
Target Strength		
7 days		
Blinding Concrete		
Blinding Concrete	Sulphate Condition	
Substructures	thickness less than 400m	
Substructures	walls and slabs more than 400m	
Superstructures	normal concrete	
	or	
67.	Fine Concrete	
Precast Concrete		
Prestressed Concrete:		
Post-tensioned tendons		
Structural concrete in water towers – all components		20 or 40

302.3 Mixes

302.3.1 If, in the opinion of the Engineer, the Prescribed Mix method of proportioning will not produce concrete to satisfy the requirements of this Specification, the mix shall be designed.

(a) Designed Mixes

Proportions shall be determined in accordance with the “Design of Normal Concrete Mixes” published by the British Department of the Environment and obtainable from:-

The Government Bookshop,
P.O. Box 569,
London,
ENGLAND SE1 9NH

or other approved methods, for the requirements set out in Clause 302.1 and 302.2

For the purpose of determining the design mean strength of the concrete a margin shall be added to the characteristic strength (indicated in Table 3.2) for the particular class of concrete. This design margin shall be assessed on the degree of control reasonably to be expected in the manufacture of the concrete and shall not be less than 7.5 N/mm² nor less than 1.64 times the standard deviation. Until such time as the standard deviation has been assessed the margin shall not be less than 15 N/mm².

Details of the designed mixes shall be forwarded immediately to the Engineer for his approval.

(b) Prescribed Mixes

Proportions for the several classes of concrete shall conform to the requirements of Table 50 of CP 110.

(c) Nominal Mixes

Nominal mix proportioning is applicable only to non-structural concrete Class 10 and Class 15 and in special cases when permitted by the Engineer for the other classes of concrete. Proportions shall conform to the requirements of Table 3.2.1

(d) Chloride Content

The total chloride content of the concrete mix shall comply with the requirements of CP 110 Cl. 6.3.8 (as amended November 1980)

TABLE 3.2.1 : Nominal Mix Proportions

Class of Concrete	Nominal Mix
30 or 30(s)	
25 or 25(s)	
20 or 20(s)	
15 or 15(s)	
10 or 10(s)	
	1 : 1 : 2
	1 : 1.5 : 3
	1 : 2 : 4
	1 : 3 : 6
	1 : 4 : 8

302.4 QUALITY CONTROL

302.4.1 The principal basis of control shall be by comparison of the results of the compression cube tests at 28 days, except for small quantities of concrete whose strength can be otherwise derived and which is permitted for use by the Engineer. 40 sample cubes shall be made initially

in eight samples each day for five days of concreting and thereafter one sample in 25 mixes or not less than one for each day's concreting.

302.4.2 Where materials are of an unfamiliar grading or type, compression tests shall be carried out at 7 days and adjustments made in advance of the main control methods outlined above.

302.4.3 Cube test results will be examined individually in 10 consecutive sets of four and the standard deviation and mean strength of each set calculated. The concrete mix proportions will only be acceptable if all of the following requirements are complied with:-

- (i) not more than two results in 40 are less than the characteristic crushing strength
- (ii) no value of the average of any set of four results is less than the characteristic strength plus one-half of the design margin (Clause 302.3)
- (iii) when 40 results have been obtained and the mean strength and standard deviation are calculated, the mean strength minus 1.64 times the standard deviation shall be greater than the characteristic strength.

302.4.4 Where the results do not confirm to the requirements the following action shall be taken:-

- (a) Adjustments to the mix shall be made to obtain the strength required.
- (b) In the case where any result is less than 80% of the characteristic strength - in accordance with Clause 305.1. For those prescribed mixes required to be tested, requirements (i) and (ii) only will be applicable.

302.5 Production

302.5.1 Aggregates and cement shall be proportioned by weigh-batching, and water shall be proportioned by volume. Subject to the prior approval of the Engineer volume-batching of aggregates may be used for small sections of work, but volume batching of cement will in no case be accepted. The Contractor may, however, so proportion the mix that each batch shall use a whole bag or bags of cement, the weight of which is known precisely. Where permission has been given for volume batching of aggregates, all gauge boxes shall be accurate and due allowance shall be made for bulking of the aggregates in assessing the correct volume to be used. (Clause 602 of CP 114).

302.5.2 The aggregates and the cement shall be thoroughly mixed in a clean mechanical mixer for a period of time agreed with the Engineer and the water added on the basis of the approved design.

302.5.3 The amount of water added shall conform to the requirement of Clause 302.1

302.5.4 Batch mixing machines shall comply with the requirements of BS 1305. They shall be provided in such numbers and of such capacity as to ensure a continuous supply of freshly mixed concrete at all times during construction.

302.5.5 Continuous mixing machines shall be used only with the written permission of the Engineer.

302.6 Cement

302.6.1 Ordinary and Rapid-hardening Portland cement shall comply with BS 12.

302.6.2 Sulphate resisting cement shall comply with BS 4027

302.6.3 High Alumina, super sulphated, pozzolanic, low heat, blast-furnace or other cements

shall only be used as directed by the Engineer. They shall not be considered within the scope of this Specification but shall be subject to the requirements of a supplementary specification when required to be used.

302.6.4 No extra payment will be made to the Contractor if on his own initiative he used Rapid-hardening Portland cement.

302.6.5 Cement shall be fresh when delivered to Site and the consignments shall be used in the order of their delivery. The Contractor shall mark the date of delivery on each consignment and each consignment shall be stored separately and in such manner as to be easily accessible and identified.

302.6.6 No cement in bags or other containers shall be used unless these and the manufacturer's seals are intact at the time of mixing.

302.6.7 If the cement is delivered in bags it shall be stored in a waterproof shed or building at a temperature of not less than 80C and the bags shall be placed on dry boards above the floor to prevent deterioration or contamination from any cause.

302.6.8 Bulk cement may be used provided it is stored in an approved container.

302.6.9 The Contractor shall not use cement which has hardened into lumps, but subject to removal of the lumps by screening, the Engineer may allow such cement to be used in non-structural concrete mixes.

302.6.10 Cement of different types shall be kept separate in storage and shall not be mixed together in the production of concrete.

302.7 Aggregates

302.7.1 Fine and coarse aggregates shall be as defined by and be of the quality and nature required by BS 882 and BS 1201 whichever is applicable. In addition they shall be chemically inert to alkali reaction.

302.7.2 Aggregates shall conform to the requirements of the "Accepted Standards" of Table 3.8.

302.7.3 Aggregates of rounded shape or otherwise capable of producing a concrete of good workability with the minimum addition of water shall be preferred.

302.7.4 The Contractor shall ensure that the nature and gradings of aggregates remain reasonably consistent, and shall, if necessary, stockpile and include different gradings to ensure that the overall grading remains constant for each section of the works.

302.7.5 Dust or flour resulting from crushing the aggregate shall not be allowed to contaminate the stockpiles. When, in the opinion of the Engineer such contamination has taken place it shall be removed by an approved means or otherwise the aggregate shall be rejected.

302.7.6 For mass concrete, in order to improve the consistency of the mix, dust or flour resulting from crushing the aggregate, may, subject to test, be included in controlled quantities to supplement the fine aggregate.

302.7.7 The aggregates of various sizes shall be kept separate and away from all possible contamination and shall be stored on a hard-standing area or in bins, provided with proper drainage at the base of the stockpiles.

302.7.8 Except where aggregates have been otherwise specified on the Drawings the grading of aggregates shall be as follows:

Coarse Aggregate:

- (a) 10mm max. size, graded, for all “fine” concrete
- (b) 20mm max. size, graded for all reinforced concrete in beams and for walls and slabs not greater than 400mm thick.
- (c) 40mm max. size, graded, for all reinforced concrete walls and slabs in excess of 400mm thick.

Fine Aggregate:

- (a) Where aggregates conforming to zones 2 or 3 of BS 882 are available they shall be used.
- (b) For prescribed mixes, zones 1,2, or 3 aggregates only shall be used.

302.7.9 Sea-dredged Aggregates

Where sound land deposits are readily available locally they shall be used in preference to sea-dredged aggregates. Where however this situation does not exist, the following requirements for the use of sea-dredged aggregates shall apply in addition to those of Clause 302.7 foregoing.

TABLE 3.3 : Shell Content

The shell content shall not exceed the following values:-

Nominal Size of Aggregate mm

% by weight of dry aggregate of shell as calcium carbonate

	Normal Reinforced Concrete Work		Liquid Retaining Structures	Main
Concrete Work				
75	Nil	Nil	Nil	
40	5	2	5	
20	10	5	10	
10	15	15	15	
Fine Aggregate	40	30	40	

Hollow shell shall not exceed one half of the total shell content by weight of 20mm and 40mm sizes.

TABLE 3.4 : Sodium Chloride Content

The sodium chloride content shall not exceed the following values:-

% Sodium Chloride content by weight

Of Dry Aggregate

Of Cement	Normal Reinforced Concrete Work	Liquid Retaining Structure	Normal
	Reinforced Concrete Work	Liquid Retaining Structure	
Coarse Aggregate			
0.05			
0.03			
0.50			
0.32			
Fine Aggregate			
0.15			
0.10			

Calcium chloride or calcium chloride-containing cements shall not be used with sea-dredged aggregates (C1.302.9)

Cements other than ordinary or rapid-hardening Portland complying with BS 12 and sulphate-resisting complying with BS 4027 shall not be used with sea dredged aggregates.

Where the use of sea dredged aggregates is shown materially to affect the rate of setting of the concrete, the Engineer may require the Contractor to include an approved admixture in the mix at no extra cost (C1.302/9)/

302.8 Water

302.8.1 The Contractor shall supply all water, make all arrangements, and pay all charges in respect of such supply. Where water can be obtained from a public water supply it shall be used.

302.8.2 Where water cannot be obtained from the public supply it shall be tested in accordance with BS 3148 and if necessary shall be treated to assure compliance therewith.

302.8.3 Water for washing and curing shall be such that it will impair neither the strength of the finished concrete nor its appearance.

302.9 Concrete Admixtures

302.9.1 Before approval for the use of a proprietary admixture is given the Contractor will be required to satisfy the Engineer as to its suitability for the work and its compatibility with the cement it is intended to complement.

302.9.2 Preference will be given to the use of admixtures which can be administered in fixed calibrated amounts through a mechanical dispenser or cachet, and which are added directly to the mixing water.

302.9.3 Where approval is given for the use of more than one type of admixture for the same concrete mix they shall be dispensed separately.

302.9.4 In all cases the Contractor shall ensure that careful control is exercised in maintaining correct proportions as laid down by the formulators. Where incorrect proportioning has been carried out, or where the admixture can be shown to have adversely affected the finished concrete, the work shall be treated in accordance with C1.305.13.

(a) Water-reducing admixtures - The Contractor shall include an approved water-reducing admixture (plasticiser) where, in the opinion of the Engineer, the workability of the mix is otherwise inadequate to achieve an acceptable compaction and/or surface finish, or where excessive bleeding of the concrete is in evidence.

(b) Air-entraining admixtures - Refer to Clause 307.2

(c) Set-retarding admixtures - Where large quantities of concrete are to be placed at any one time or where concreting is undertaken under hot conditions, the Contractor may include an approved set-retarding admixture to reduce the heat of hydration and to enable work to be properly finished before premature setting has taken place.

Where sea-dredged aggregates are used the Engineer may require an approved set-retarding admixture to be included in the mix (C1.302.7.9)

(d) Set-accelerating admixtures - The Contractor shall not use set-accelerating admixtures in in-situ concrete construction except for cold weather concreting (C1.305.4) or where expressly permitted by the Engineer for a specified purpose.

(e) Calcium chloride admixtures or ingredients included in propriety type cements shall not be used in reinforced concrete or pre-stressed concrete work.

303 REINFORCEMENT

303.1 Steel

303.1.1 Reinforcement shall be:

(a) Plain round mild steel or High Yield steel bars conforming to BS 4449.

(b) Cold worked steel bars conforming to BS 4461 or

(c) Fabric reinforcement made of cold drawn high tensile bars conforming to BS 4483.

303.1.2 The Contractor shall obtain from his supplies certificates of the mechanical and physical properties of the reinforcement and shall submit them to the Engineer for approval, except where reinforcement has been supplied by the Employer. The frequency of sampling and the method of quality control shall be in accordance with Table 4 and Clause 20 respectively of these British Standards. All high yield and cold worked bars (except in welded fabric reinforcement) shall be deformed bars complying with classification Type 2 for bond strength in accordance with Classification Type 2 for bond strength in accordance with BS 4449 and BS 4461. Where galvanised reinforcement is specified, galvanizing shall comply with the requirements of BS 729, Part 1.

303.2 Storage

Reinforcement 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 distorting of the steel is avoided and contamination and corrosion prevented.

303.3 Bending and Fixing of Reinforcement

303.3.1 The Contractor shall provide on site facilities for cutting and bending reinforcement whether he is ordering his reinforcement bent or not and shall ensure that a token amount of straight bar is available on Site for bending as and when directed by the Engineer.

303.3.2 Reinforcement shall be wire brushed and cleaned at the Contractor's expense, before and/or after it is placed in position, if required by the Engineer.

303.3.3 The bars shall be cold bent in strict accordance with the drawings and the Contractor

shall be responsible for the accuracy of the bending. Bending dimensions shall be worked to the tolerances indicated in BS 4466 and CP 110 Table 20. Bars in which any errors in bending are beyond the limits of the foregoing tolerances shall be replaced at the Contractor's cost by correctly bent new bars, or, may be straightened and rebent cold subject to the Engineer's prior approval. Any discrepancy or inaccuracy found in the drawings shall be notified to the Engineer immediately.

303.3.3 After assembling, reinforcement shall be securely bundled and labelled with weather-proof tags or shall be marked with other approved signs by which it can readily be identified.

303.3.4 After bending, reinforcement shall be securely bundled and labelled with weather-proof tags or shall be marked with other approved signs by which it can readily be identified.

303.3.5 Before assembling or fixing the reinforcement the dimensions to which it has been bent shall be checked by the Contractor against the drawings

303.3.6 The reinforcement 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 the displacement of reinforcement during the placing and compaction of concrete.

303.3.7 Where required to support and retain the reinforcement 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 included in the bar schedules as standard lengths.

303.3.8 Precast concrete support blocks for reinforcement shall be manufactured from Class 30 "fine" concrete to ensure the correct cover thickness. They shall be well cured before use and carefully stored on Site to avoid contamination. Plastic and metal supports, chairs, etc. may be used subject to the Engineer's prior approval.

303.3.9 In the case of mild steel, a lap of not less than 40 diameters of the smaller bar shall be provided at the junction of two bars for which the lap is not specifically detailed on the drawings and, in the case of High Yield steel, a lap of not less than 50 diameters.

303.3.10 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 which shall not be allowed to make contact with the shuttering or to project materially into the specified cover.

303.3.11 Unless permitted by the Engineer, welding of bar reinforcement at intersections or for the joining of bars is prohibited. Where permission is granted, welding shall be carried out in accordance with the recommendations of the Institute of Welding for the welding of reinforcing bars for reinforced concrete construction.

303.3.12 When fixed reinforcement is to be left exposed for a delayed period of time, it shall be thoroughly cleaned and painted with neat cement grout.

303.3.13 Where galvanised reinforcement is used any damage suffered by galvanising shall be made good by the application of an approved galvanising formulation, before concrete placing is commenced.

303.4 Couplers for Reinforcement

Couplers for reinforcement shall be either Standard Swaged Splices or Type II Alpha Couplers manufactured by CCL Systems Limited, Cabco House, Ewell Road, Surbiton, Surrey, KT9 7AH, UK., or similar approved. Where bars of different diameters are to be joined a CCL Reducer Sleeve or similar shall be used.

Couplers shall be suitable for the type and size of reinforcing bars and shall be capable

of developing 15% of the characteristic strength of the smaller of the compression. Couplers shall be installed in accordance with the manufacturer's recommendations. Square twisted reinforcing bars shall not be used with couplers.

304 SHUTTERING

304.1 Requirements

304.1.1 The term "shuttering" shall be taken to include centering, formwork, strutting, bracing and the like.

304.1.2 When called upon to do so by the Engineer's Representative the Contractor shall submit his shuttering proposals for checking and approval by the Engineer in advance of the concreting.

304.1.3 Shuttering shall be of such accuracy, strength and rigidity as to carry the weight and pressure from the concrete to be placed on or against it, together with all constructional, wind or other loads likely to be imparted to it, without producing deformation of the finished concrete in excess of the tolerances outlined in Clause 304.5 and Table 3.5.

304.1.4 All shuttering shall be sufficiently tight, without plugging, to prevent loss of grout during the vibration of the concrete. When required by the Engineer joints between shutter facing boards shall be sealed with foam rubber, sealing strips or other approved material.

304.1.5 Faces of shuttering shall be clean, Faces of shuttering shall be clean, free from projecting nails, adhering grout and other imperfections or defects which would prevent the specified surface finish from being attained. They shall be treated with approved mould oil before positioning. Great care shall be exercised to prevent reinforcement or steelwork from being contaminated by the oil during erection of the shuttering.

304.1.6 Shuttering, which as a result of prolonged use of general deterioration does not, in the opinion of the Engineer, conform to the particular requirements set out in this clause, shall not be used.

304.1.7 Through-bolts or ties will not be permitted in liquid-retaining structures. The Contractor shall use only such bolts or ties as are capable of being removed in whole or in part so that no part remaining embedded in the concrete shall be nearer the surface of the concrete than the specified thickness of cover to the reinforcement.

304.1.8 Beam soffits shall be erected with an upward camber of 5mm for each 3 metres of span.

304.1.9 Top shuttering shall be counterweighted or otherwise anchored against flotation.

304.1.10 Boxes for forming holes shall be constructed so as to be easily removable without damaging the concrete during removal. They shall be properly vented to permit the escape of entrapped air, and shall be capable of being sealed, subsequently to prevent the loss of grout. The use of polystyrene blocks for the forming of holes, sinking, etc. will not be allowed except by express permission of the Engineer.

304.1.11 Openings for inspection of the inside of beam, wall, column, and similar shuttering and for cleaning-out purposes shall be formed so that they can conveniently be closed before the placing of concrete.

304.1.12 All props shall be supported on adequate sole plates and shall not bear directly on or against concrete. They shall be capable of being released gently and without shock from the supported shuttering. No appliance for supporting the shuttering shall be built into the permanent structure without the Engineer's prior approval. Props for upper level support shall be placed directly over those at lower levels, and the lowermost props shall bear upon work sufficiently mature to carry the load.

304.1.13 Shuttering shall be such as to allow for its removal without damaging the concrete, and in the case of suspended floors, for the removal of the beam sides and slab soffits without disturbing the beam sides and slab soffits without disturbing the beam bottom boards and their props.

304.1.14 Before concreting, the areas which are intended to receive the concrete shall be cleaned by jetting with compressed air, and all water and extraneous material removed.

304.1.15 Where timber is used for shuttering it shall be properly cured, free from warp, straight, clean, and free from loose knots.

304.1.16 Where metal forms are used for shuttering they shall be of the type strengthened by intermediate ribs or cross bracing.

304.1.17 Moving shuttering may be used where in the opinion of the Engineer it is appropriate.

304.2 Sawn Shuttering

Rough finish shuttering shall produce an ordinary standard of finish consistent with normal good practice for use where the face of the finished concrete will not be exposed. The face in contact with the concrete shall consist of sawn timber boards, sheet metal or other approved material.

304.3 Wrought Shuttering

Wrought shuttering for use on internal exposed faces and water retaining faces shall produce a high standard of finish consistent with the best practice. The face in contact with the concrete shall consist of wrought and thickened boards tongued and grooved of not less than 30mm finished thickness, framed plywood or metal panels or other approved material. Joints between boards and/or panels shall be arranged in a uniform pattern

304.4 Special Wrought Shuttering

Special wrought shuttering shall provide the highest standard of finish where the face of the finished concrete is to form a particular feature. The face in contact with the concrete shall consist of large smooth sheets, unless otherwise specified, arranged in an approved uniform pattern, with joints coinciding with possible architectural features, sills, window heads, or changes in direction or surface. Accurate alignment of all joints shall be maintained. Wrought boarding and standard steel panels shall not be used unless specially faced.

304.5 Tolerances

Unless otherwise indicated on the Drawings, the tolerances of the finished concrete with respect to the dimensions shown on the drawings shall not exceed the limits set out in Table 3.5.

Table 3.5 : Tolerances of Dimensions for Finished Concrete

Items Tolerance (mm)
Overall dimensions and levels

Column Sizes)
Beam Sizes)
Wall Sizes)

Vertical lines out of plumb + 5

+ 5

5mm + 5mm in every 15m ht.

Except that in the case of Rough Finish Shuttering the dimensions of the finished concrete shall be not less than those shown on the Drawings.

304.6 Striking and Removal of Shuttering

304.6.1 The recommendations set out in Table 3.6 are given as a minimum requirement for striking shuttering:-

TABLE 3.6 : Striking of Shuttering

Item Ordinary Portland Cement

Normal Weather 160C

Days Rapid-Hardening Cement

Normal Weather

160C Days

Beam Sides, Walls, Columns

Slabs (props left under)

Beam soffits (Props left under)

Removal of props to slabs

Removal of props to beams 1

4

7

8

16 1

3

5

5

8

304.6.2 The above striking times are for normal conditions and before deciding on the actual time for each case, the Contractor shall consider and extend the period as tabled if:-

(a) the span of the structural member under consideration exceeds 6 metres for beams and 3 metres for slabs. An additional period of one day for each 500mm of additional span shall then be allowed;

(b) the dead load of the structural member under consideration forms a large proportion of the total design load;

(c) constructional loads coming on to the structural member under consideration are being placed soon after the concreting operations and these loads form a large proportion of the total design load;

(d) the setting of the concrete has been retarded for any reasons;

(e) the temperature falls below 80C. An additional period of half day shall be added for each day on which the temperature falls below 80C. For temperatures falling below 30C the additional period to be added shall be one day for each day on which the temperature falls below 30C;

(f) any combination of the above points and other considerations which would call for such a precaution to be taken.

304.6.3 Information regarding paragraph (b) above will be supplied by the Engineer; any other design information relevant to be above shall be obtained by the Contractor from the Engineer.

305 CONCRETING

305.1 Requirements

The finished concrete shall be dense, durable, impervious to the ingress of water, free from cracks and honeycombing, and resistant to wear and mild chemical attack. Special concretes will be the subject of their own particular sections of Clause 307.

305.2 Transporting of Concrete

305.2.1 Concrete shall be transported to the place of final deposit by approved means.

305.2.2 Barrows, spades and other equipment used in the process of transporting concrete shall be thoroughly cleaned before each day's work or after a long interruption and they shall be free from hardened concrete.

305.2.3 Concrete shall be transported as soon as possible after mixing, by methods which will prevent the segregation, loss or contamination of the ingredients.

305.2.4 Proper bridging arrangements for traffic over reinforcement shall be provided so that the reinforcement is not distorted, damaged or displaced.

305.2.5 Where approval is obtained for concrete to be conveyed by chutes, these shall have a slope (not exceeding 1 vertical to 2 horizontal) such as to ensure a continuous flow of concrete. Additional water shall not be introduced to assist the flow. If deposition is to be intermittent the chute shall be arranged to discharge into a storage hopper. In no case will a clear fall of more than 1m be permitted at the discharge end of the chute.

305.2.6 Where approval is obtained for pumping the concrete, the pump manufacturer's recommendations shall be followed. The pumps used shall be adequate capacity and power to ensure delivery of a continuous supply. The Contractor shall provide adequate alternative arrangements for transporting the concrete in case of a breakdown of the pumping equipment. (see also Clause 307.7).

305.2.7 Wherever transport of concrete is interrupted for any length of time (periods over half an hour shall be treated as such) the chutes, pumps, pipes and any

Other means of distribution shall be thoroughly flushed out and cleaned. These shall also be flushed out immediately prior to resumption of concreting and shall be kept free from hardened concrete. All wash water used shall be discharged outside the shuttering and clear of any freshly placed concrete.

305.3 Placing and Compaction of Concrete

305.3.1 No concrete shall be placed until the Contractor has obtained approval to do so from the Engineer's Representative. When the Contractor intends to place concrete he shall inform the Engineer's Representative in sufficient time to enable him to inspect the reinforcement, shuttering, and surface on which the concrete is to be placed and the Contractor shall provide all facilities for such inspection.

305.3.2 Concrete shall be placed within 30 minutes of mixing, to uniform level, in layers not exceeding 500mm deep in such manner as to avoid segregation, and each layer shall be compacted by means of approved vibrators to form a dense material free from honeycombing and other blemishes. Compaction by hand may be used only with the prior approval of the Engineer.

305.3.3 Vibration time, the effective radius, and other vibration characteristics shall be in accordance with the vibrator manufacturer's recommendations.

305.3.4 If internal vibrators are used, they shall be withdrawn immediately when a thin film of mortar begins to appear on the surface of the concrete. Withdrawal shall be carried out slowly to avoid cavitation.

305.3.5 Where two distinct batches of concrete, placed at different periods of time and forming part of the same concreting operation are required to be formed monolithically with each other, the more mature concrete shall be penetrated by the vibrator to a sufficient depth to effect plastic movement between the two batches. Where the concrete does not respond to the action of the vibrator, it shall be deemed to have set, and no further disturbance will be permitted. Unless otherwise instructed by the Engineer the condition shall be treated as for a "stoppage of work" and the marrying up of the two concretes shall be effected only when both concretes have properly set.

305.3.6 If shuttering vibrators are used, the shuttering shall be strong enough to withstand the forces of vibration.

305.3.7 Temporary or permanent stoppages of work shall be made only against stop ends (Clause 305.9).

305.3.8 Unless otherwise specified, before placing new concrete against concrete which has already hardened, the face of the older concrete shall be prepared by the removal of any laitance and loose aggregate, and shall be cleaned by a jet of compressed air.

305.3.9 When displacers are permitted to be used they shall be so placed that no displacer is within 300mm of any finished face or within 500mm of any other displacer. On completion of any lift, displacers shall be so arranged that they project for half their height above the surface.

305.3.10 Concreting in Deep Lifts

305.3.10.1 Limitations

Any height exceeding 2.5m from which concrete is poured into shuttering to form sections of wall will be considered within the terms of this Clause.

Deep lift construction will not be permitted where the reinforcing bars are to be placed closer than 100mm to one another in any direction or, where the clear width at the point of admitting the concrete between one layer of reinforcement and another (or in the case of singly reinforced walls between reinforcement and shutter) is less than 200mm.

The method shall only be used where trial sections revealed that, in the Engineer's opinion it can be satisfactorily employed, in which case the requirements of this Specification shall apply except where they are in conflict with the requirements of this particular clause, when the latter shall prevail

305.3.10.2 Concrete

In order to prevent segregation of aggregates, concrete mixes shall be designed for increased cohesion, or, where suitable, on a gap-graded basis. The use of approved admixtures

may be made to achieve this end (302.9).

At the same time, the mix shall be such as to limit the amount of bleeding in the concrete, and where in the opinion of the Engineer the quantity of free water rising to the surface is excessive, the mix shall be corrected before further concreting is undertaken.

In order to offset any increase in the water-cement ratio at the upper levels, the Engineer may require the concrete mix to be modified for the upper depositions.

A slump of 80mm shall not be exceeded.

305.3.10.3 Reinforcement

In order that reinforcement is not distorted or displaced during construction as a result of it being used for gaining access in or out of the shuttering, all intersections of vertical and horizontal steel shall be properly fastened.

All obstructions caused by spacer blocks or chairs shall be eliminated so as to permit an unobstructed passage for the concrete to the bottom of the shuttering. The Contractor may use sliding timber spacers instead of fixed concrete or plastic spacer blocks to position the reinforcement.

305.3.10.4 Shuttering

In view of the high pressures to be expected from this form of construction extra attention shall be paid to the strength and stability of the shuttering, to the prevention of loss of grout, and to the prevention of displacement of adjacent panels.

The use of through-bolts and other accessories which might interfere with the free passage of concrete between and around the reinforcement shall be reduced to a minimum of the use of properly designed shuttering.

305.3.10.5 Concreting

Particular attention shall be paid to the concreting of the initial sections at the bottom of the shuttering to prevent segregation caused by rebound from the hard surface of the kicker, base and/or lower sections. The initial depositions shall therefore be made by using trunking methods, or by placing the concrete through openings formed in the sides of the shuttering. Such openings shall not be higher from the hard surface than 2.5m.

In order to reduce differential settlement, and consequently, cracking between two sections of concrete placed at different intervals of time, concreting between one section and another shall be carried out on a gap-construction basis (Clause 305.9). The gap shall subsequently be concreted in distinct lifts each not exceeding 2.5m in height. For the same reason, for concreting two adjacent sections placed at the same time but of different heights (e.g. where boxing out is included), the difference in height shall not exceed 15% of the height of the deeper section.

Concreting from the upper level of the shuttering shall be carried out in such manner as to ensure that concrete is admitted centrally between the faces of the shuttering.

For this purpose the Contractor shall make use of trunking or shall use funnel-shaped hoppers extending for a distance of not less than 1.5m into the shuttering. A sufficient number of such hoppers shall be provided, and/or they shall be capable of movement along the length of the shuttering, to enable the concrete to be placed in contiguous heaps at the base of the pour. Such heaps shall not exceed 460mm in height.

Where excessive bleeding is in evidence, the excess water shall be removed before placing

further concrete (see sub-clause 305.3.10.2 of this clause).

305.3.10.6 Compaction

Compactions shall be carried out where possible by manual operation of poker vibrators within the shuttering. Where this is not possible poker vibrators shall be suspended in sufficient numbers to ensure uniform compaction along the length of wall receiving the concrete, without the need for their withdrawal and re-insertion. The means of suspension shall be such that the vibrators may be progressively and systematically lifted as the concreting proceeds to ensure that every section of placed concrete is married into adjacent and underlying sections.

The use of vibrators to reposition deposited concrete is prohibited. Surface vibrators attached to the shuttering may be used only to supplement the main means of compaction.

305.4 Cold Weather Concreting (Using cement to BS 12)

305.4.1 No concrete shall be placed while the air temperature is below 50C without the permission of the Engineer.

305.4.2 In the event of the Engineer giving permission for concreting to be carried out when the air temperature is below 50C the following conditions shall apply:-

- (a) Concreting shall be at the sole risk of the Contractor and shall be carried out during the day only;
- (b) No structural concrete shall be placed on frozen ground;
- (c) No structural concrete shall be placed on frozen ground;
- (d) Concrete shall have a temperature of between 160C and 240 C on leaving the mixer and it shall be placed in position and compacted before its temperature has dropped to 50C. To effect this, pre-heating of the mixer, heating of mixing water to a temperature not exceeding 600C, and heating of aggregates to not exceeding 500C is permitted, but on no account shall cement be heated or admitted to the mixer until the aggregates and the water have been thoroughly mixed;
- (e) If the Engineer gives approval for the use of calcium chloride to accelerate the hardening, not more than 2% by weight of flake calcium chloride (calcium chloride to cement) shall be added. Where proprietary accelerators are used their proportions shall be adjusted to satisfy this requirement. In all cases the calcium chloride shall be dissolved in the mixing water before adding to the mix. Calcium chloride and proprietary accelerators shall not be used with other than Ordinary or Rapid Hardening Portland Cement, nor where sea-dredged aggregates are permitted to be used (Clause 302.7.9);
- (f) The placed concrete shall not be allowed to fall below 30C until it has thoroughly hardened. The provision of heaters, adequate covering the insulation shall be made as may be required to ensure this. Care shall be taken to prevent over-heating or carbonation of the concrete;
- (g) The period over which the precautions set out in (f) above shall apply (referred to as pre-hardening period) shall not be less than 3 days unless otherwise permitted by the Engineer. Concrete temperatures shall be taken three times each day, morning, noon and evening, each at two separate positions expected to give the least favorable results;
- (h) Concrete once placed shall not be subjected to curing techniques involving the application of water to the surface;

The use of steel shuttering, unless insulated, will not be permitted.

305.5 Hot Weather Concreting (for temperatures above 20 Degrees Centigrade)

305.5.1 Concreting shall not be permitted if its temperature at placing is in excess of 300C. In order to maintain the temperature of the concrete below this value the following precautions shall be taken wholly or in part as instructed by the Engineer:-

- (i) All aggregate stockpiles, water lines and tanks as well as the mixer shall be protected from the direct rays of the sun;
- (ii) Coarse aggregate shall be cooled by constant watering where possible;
- (iii) Mixing water shall be cooled by the addition of ice to the storage tanks where necessary;
- (iv) Rapid-hardening cement shall not be used;
- (v) Where the above precautions are inadequate concreting shall be carried out during the cooler parts of the day or during the night as may be directed by the Engineer.

305.5.2 When the air temperature is above 20°C loss of mixing water by evaporation shall be considered in arriving at the amount of water to be added to the mix (Clause 302.1). In order to maintain the water/cement ratio within permissible limits an approved water-reducing agent shall be included in the mix (Clause 302.9).

The maximum water/cement ratios indicated in Clause 302.1 may be increased with the Engineer's permission by 0.05) or 2.5 litres/50 kg of cement) during mixing, but on no account shall water be added to concrete directly or indirectly once it has left the mixer.

305.5.3 In order to reduce premature drying of the concrete during transporting and placing, all chutes, shuttering and reinforcement shall be cooled by watering when possible, or shall otherwise be protected from the direct rays of the sun. Any water so used shall be removed by jetting with compressed air before placing the concrete in close contact.

305.5.4 As soon as possible after concreting, the shuttering shall be stripped (Clause 304.6) and the surface of the concrete shall be treated in accordance with Clause 305.8.

Where drying winds are encountered, wind shields shall be positioned as directed by the Engineer to protect exposed surfaces of the curing concrete.

305.6 Wet Weather Concreting

305.6.1 Concreting during periods of constant rain shall not be permitted unless aggregate stockpiles, mixers and transporting equipment, and the areas to be concreted are adequately covered.

305.6.2 During showery weather, the Contractor shall ensure the work can be concluded at short notice by the provision of stop ends. On no account shall work be terminated before each section, between one stop end and another, is complete. Adequate covering shall be provided to protect newly placed concrete from the rain.

305.7 Holes, Cavities and Fixing

305.7.1 The Contractor shall be responsible for the co-ordination of all requirements of his sub-contractors as regards provision of holes, chases, cavities and fixings and shall, if required by the Engineer, prepare drawings giving details of his and his sub-contractors' requirements and shall send copies of such drawings to the Engineer prior to construction.

305.7.2 Holes, etc. shall be accurately marked and boxed-out for before concreting operations commence and, without the Engineer's prior approval, no such holes, etc. shall be formed after the concrete has set.

305.7.3 Where bars, if placed to specified spacing would foul holes of sizes less than 250mm x 250mm the full length of the bar shall be moved to one side and in the case of holes exceeding 250mm x 250mm the bars shall be cut on site and lapped with additional equivalent bars, or as otherwise indicated on the Drawing.

305.7.4 Wherever possible, the Contractor shall build in all pipe work, ironwork, etc. which passes through walls and floors, and the pipe work, ironwork, etc. shall first be thoroughly cleaned and freed from any deleterious matter, and every care shall be taken to ensure that it is thoroughly encased in concrete.

305.7.5 Bolts, hooks, and other fixings shall be embedded in concrete, or holes shall be drilled and fitted with threaded expanding anchors to receive the bolts. The Contractor shall ensure that bolts, hooks, etc. are accurately positioned. Holding down bolts for machinery shall be set to template.

305.7.6 Where brick or stonework is to form a facing to the concrete or where the end of a brick or stone wall butts against a concrete face, galvanized metal ties of approved manufacture to BS 1243 shall be incorporated.

305.7.7 The distance between ties shall be gauged with due regard for the bonding of the walls, and at intervals required by the Engineer.

305.8 Protection and Curing of Concrete

305.8.1 Newly placed concrete shall be protected by approved means from rain, drying winds, sun, and contact with substances which can adversely affect it.

305.8.2 No traffic or constructional loads shall be permitted on newly placed concrete until it has hardened sufficiently to take such traffic or load, and only then with the approval of the Engineer (305.13).

305.8.3 Exposed faces of concrete shall be kept moist after placing for not less than 3 days if Ordinary Portland and 2 days if Rapid Hardening cement is used. Membrane curing by approved materials may be used when permitted by the Engineer.

305.8.4 Any concrete surfaces, arises and treads of stairways which might be damaged during the construction of the Works shall be adequately protected.

The method of curing shall prevent loss of moisture from the concrete. Immediately after compaction and for 7 days thereafter concrete shall be protected against harmful effects of weather, including rain, rapid temperature changes and from drying out.

The curing time shall be the number of days given in the following table unless the average temperature of the concrete during the required number of days falls below 10°C in which case the period curing shall be extended until the maturity of the concrete reaches the value given in the table.

Curing shall be carried out using either of the following basic methods. The method adopted for any particular situation shall be agreed with the Engineer.

TABLE 3.7: Normal Curing Periods

Minimum period of protection for different types of cement

Conditions under which concrete is maturing

Number of days (When the average temperature of the concrete exceeds 10°C during the whole

of the period)

Equivalent maturity (deg.C Hors) (calculated as the age of the concrete in hours multiplied by the number of degrees Centigrade by which the average temperature of the concrete exceeds – 100C)

Type IV

Type I or Type V

Type III

Type IV

Type I or Type V

Type III

1. Hot weather or drying winds

7

4

2

3500

2000

1000

2. Conditions not covered by 1.

4

2

1

2000

1000

500

Type IV - Low Heat Portland Cement

Type I - Ordinary Portland Cement

Type III - Rapid-hardening Portland Cement

Type V - Sulphate-resisting Portland Cement

Where the thickness of concrete placed exceeds 1.5m, the Contractor shall submit for the Engineer's approval proposals to ensure that, during the curing period:-

- (a) the rate of rise of temperature in the concrete does not exceed 150C per hour for the first 3 hours;
- (b) thereafter the rate of rise and fall of temperature in the concrete does not exceed 350C per hour;
- (c) the maximum difference temperature in the concrete does not exceed 700C; and
- (d) the maximum difference in temperature between the core and the surface of the concrete does not exceed 200C.

The proposals shall include consideration of:-

- (a) concrete mix design;

- (b) temperature of mix at time of placing;
- (c) Method of curing.

Where required by the Engineer, the Contractor shall carry out temperature measurements in the concrete. The method and procedure of temperature measurement shall be agreed with the Engineer.

305.9 Joints

305.9.1 Construction Joints

The position of construction joints, when not shown on the Drawings or otherwise required by this Specification, shall be decided on site having regard to the plant and labour made available by the Contractor for the manufacture, placing and compaction of the concrete as well as its curing, the climatic conditions prevailing at the time of concreting, the nature and size of the shuttering, and the conditions of operation of the work. The contractor shall submit his proposals to the Engineer for his approval before commencing work.

Construction joint surfaces shall be treated by the “wash-off” method explained below, except in the case of Cold Weather Concreting (Clause

305.4) or where it cannot be practically effected, in which case it shall be treated in accordance with Clause 305.3 as for the placing of new concrete to hardened concrete.

When expanded metal lathing is used for the formation of construction joints a rebate will not be required to be formed. The expanded metal lathing shall be left in the work and shall not extend closer to the finished surface of the concrete than 25mm. It shall be securely fixed to the reinforcement.

The following particular requirements shall also be observed: -

- (i) Slabs supported on the ground

In order to ensure control in the placing of concrete the Contractor shall provide control boards to form panels not larger than 15m² in area. These shall be lifted as the concreting proceeds except where they are of expanded metal in which case they may be left in position as part of the permanent works, provided that they shall not extend closer to the finished surface of the concrete than 25mm. In the event of a breakdown in the supply of concrete the Contractor shall ensure that an alternative supply of concrete is made available (to finish the work against the control boards acting as stop ends). The joint so formed shall then be treated as a construction joint. Where ready-mixed concrete is permitted (Clause 307.4) the control boards shall be positioned so as to enclose a volume of concrete equal to that delivered by each truck.

Construction joints and control joints shall be formed normal to the surface of the retained concrete.

- (ii) Suspended Beams and Slabs

The reference to control boards in the foregoing para. (I) shall apply, but generally, unless otherwise shown on the Drawings or permitted by the Engineer, construction joints shall be positioned at approximately midspan in both beams and slabs.

T-beams shall be formed to their full depth integrally with the adjacent slab and without horizontal joints.

- (iii) Walls

Horizontal construction joints in walls shall be formed along straight lines coinciding with the full height of the shuttering. The height of the shuttering thus controlling the height of the pour shall be determined with reference to the availability of concrete, the size, and amount of reinforcement and the means of compaction available.

Unless otherwise indicated on the Drawings or otherwise permitted by the Engineer for the construction of circular tanks, concreting shall be carried out continuously for the full circumference without vertical joints. Where permission is granted for the use of vertical joints the Engineer may order, at no extra cost to the Employer, the inclusion of an approved type of water stop.

In the case of rectangular tanks, vertical joints shall not be positioned closer to any corner than one metre. They shall be formed with properly rebated stop ends or, where conditions permit, by the use of expanded metal lathing.

Un-reinforced manholes shall be constructed without vertical joints.

305.9.1.1 The “Wash-off Method” of preparing Construction Joints

As soon as possible after concreting, and while the surface is still green, the surface of the concrete forming the joint shall be freed of loose aggregate and sprayed with a fine spray of water to prevent the formation of laitance. Subsequently all excess water shall be removed by a jet of compressed air and the surface left clean to receive further concrete.

Where expanded metal lathing is used for construction joints, this method of surface preparation shall be used in every case.

305.9.2 Movement Joints

These shall include contraction and expansion joints and shall be as indicated on the Drawings.

Contraction joints will be either full contraction joints or partial contraction joints. Where partial contraction joints are specified a period of at least five days shall elapse between the concreting of the section on each side of the joint.

Where the Drawings indicate a contraction gap to be formed in any panel (this gap will not exceed one metre), concreting on either side of the gap shall be carried out so as to form partial contraction joints at each side of the gap.

Prior to the concreting of the gap section, the joint surfaces shall be cleaned but otherwise left untreated. The concreting of the gap section shall not be carried out until a period of at least five days has elapsed after completion of the adjacent sections.

Alternate panel construction (other than contraction gap construction outlined above) will be permitted only with the approval of the Engineer, or in those cases where either the reinforcement is not continuous through the joint or where the panels are separated by expansion or contraction joints.

Unless otherwise specified or permitted by the Engineer all water stop shall consist of rubber. Jointing of water stop shall be by vulcanizing, except where PVC is specified or permitted in which case joints shall be by fusing or welding. Materials shall be obtained from an approved manufacturer whose recommendations as to jointing shall be fully complied with.

305.9.3 Water stop and Jointing Materials

305.9.3.1 Water stop and jointing materials shall be obtained from an approved manufacturer.

305.9.3.2 All water stop and jointing materials which are not required for immediate use shall be stored at all times in a cool damp place.

305.9.3.3 Water stop shall be manufactured of rubber or PVC (polyvinylchloride) as stated in the Bill of Quantities and shall be made strictly in accordance with the manufacturer's instructions and all intersections and junctions shall be obtained prefabricated from the approved manufacturer.

305.9.3.4 Joint filler shall be manufactured of natural bonded cork or other approved material. Joint filler shall be cut and trimmed accurately to suit the joint profile and shall be maintained accurately in position by means of an approved adhesive.

305.9.3.5 Joint sealing compounds shall be approved rubber/bituminous compounds suitable for sealing joints in horizontal and vertical/sloping concrete surfaces as appropriate. Sealing compounds shall be applied strictly in accordance with the manufacturer's instructions and shall completely fill the joint recess. Surface primers shall be from same manufacturer as the sealants themselves.

305.9.3.6 Water stop shall be located and maintained accurately in position and details of the proposed method of fixing shall be submitted to the Engineer for approval. On no account shall waters to be secured by nails or by any other means involving puncture of or damage to the water stop material unless purpose made nailing flanges are incorporated in the design of the water stop.

305.10 Finishes to concrete - General

305.10.1 All exposed faces of concrete unless otherwise specified shall be hard, smooth and free from honeycombing, air and water holes and other blemishes.

305.10.2 All projecting imperfections shall be rubbed down with carborundum stone or by other approved means and grit and dust there from shall be thoroughly washed off with clean water.

305.11 Surface Finishes

(a) Wood float finishes shall be formed by smooth floating the accurately leveled and screeded surface. Care shall be taken to ensure that the concrete is worked no more than is necessary to produce a uniform surface free from screed marks.

(b) Steel trowel finishes shall be formed while the concrete is still wet by means of a steel trowel applied to an accurately leveled and screeded surface (see also Clause 307.3)

(c) Granolithic finishes shall conform to the recommendations laid down in "Specification for Granolithic floor toppings laid in in-situ concrete", as published by the cement and Concrete Association with special reference to monolithic construction.

(d) Screeded finishes shall be formed by leveling and screeding the concrete to produce a uniform, plain or ridged surface as specified.

(e) Bush-hammered or patten-worked finishes.

When exposed aggregate is to be the surface texture, the Contractor shall ensure that a uniform distribution of the course aggregate takes place at the face. The shuttering shall be removed as soon as possible from the face to be treated; the surface shall be thoroughly wetted and wire brushed, and bush-hammered or pattern-worked as and when instructed. Surface retarders shall be used only when permitted by the Engineer.

Bush-hammering or patten-working shall not be relied upon to obscure any defects in the concreting face which arise from shuttering imperfections.

305.12 Making Good

Honeycombed or damaged surfaces of concrete, which in the opinion of the Engineer, are not such as to warrant the cutting out and replacement of the concrete, shall be made good as soon as possible after removal of the shuttering as follows:-

1:1.5 Portland Cement and sand mixture shall be worked into the pores over the whole surface

with a fine carborundum float in such a manner that no more material is left on the concrete face than is necessary completely to fill the pores so that a uniformly smooth and dense surface of uniform colour is finally presented.

305.13 Removal and Replacement of Unsatisfactory Concrete

The Contractor shall on the Engineer's instructions to do so cut out and replace any concrete in any part of the structure if in the Engineer's opinion:-

- (a) the concrete does not conform to the Specification, or
- (b) deleterious materials or materials which are likely to produce harmful effects have been included in the concrete, or
- (c) the honeycombed or damaged surfaces are too extensive, or
- (d) the finished concrete sizes are not in accordance with the Drawings within permissible tolerances, or
- (e) the setting-out is incorrect, or
- (f) the steel cover has not been maintained, or
- (g) the protection, including curing, of the concrete during the construction was inadequate, resulting in damage, or
- (h) the work of making good or other remedial measures the Engineer may indicate are not carried out to his satisfaction, or
- (i) Undue deformation of or damage to the works has taken place due to inadequate shuttering, or to premature traffic or to excessive loading, or (j) any combination of the above points has taken place resulting in unsatisfactory work.

306 TESTING

306.1 Sampling and Testing (see also Clauses 301.0 and 302.4)

306.1.1 The contractor shall provide on the Site equipment, staff and labour for carrying out the sampling and testing outlined in columns 3 and 4 of Table 3.8, and he shall carry out any or all of these tests at such times and with such frequency as may be requested by the Engineer.

306.1.2 All equipment shall be calibrated and checked from time to time as the Engineer may require.

306.1.3 The Contractor shall provide samples required by the Engineer. Those samples to be tested in a laboratory as required by Column 5 of Table 3.8 shall be carefully forwarded by the Contractor to an approved laboratory. Results of laboratory and site tests shall be kept on site and copies of all test reports shall be forwarded in duplicate to the Engineer's Representative.

306.1.4 Frequency of tests and the number of samples required will be governed by the results of the previous tests, the quality of the materials revealed during the tests, and the uniformity of the quality (see Clause 302.4). Should it become evident that the quality of concrete is deteriorating the Engineer may require additional samples to be taken and test cubes to be made and tested to determine the cause.

306.2 Loading Tests

306.2.1 The Engineer may direct that a loading test be made on the works or any part thereof

if he deems such test to be necessary for one or more of the following reasons:-

- (a) failure of “Site Cubes” to attain the strength requirements of Clause 302.4;
- (b) premature removal of shuttering;
- (c) overloading of structure during construction;
- (d) improper compaction and/or curing of concrete;
- (e) any other circumstances attributable to alleged negligence on the part of the Contractor, which in the opinion of the Engineer, may result in a structure being of less than the required strength;

306.2.2 If the loading test be ordered to be made solely or in part for reasons (a) to (d) the test shall be made at the Contractor’s own cost.

306.2.3 If the loading test be ordered to be made for reason (e), the Contractor shall be reimbursed for the cost of the test if the result is satisfactory.

306.2.4 Loading test shall be carried out in accordance with Clause 9.5 or 9.6 of CP 110 as appropriate.

306.2.5 If the results of the test are not satisfactory, the Engineer will direct that the part of the work concerned by taken down or removed and reconstructed to comply with the Specification, or that such other remedial measures as he may think fit be taken to make the work acceptable and the Contractor shall carry out such work at his own cost.

306.2.6 The Engineer may also instruct the Contractor before a loading test takes place to take out cylindrical core specimens from the structures concerned and have them tested. The cutting equipment and the method of doing the work shall be to the Engineer’s approval. The specimens shall be dealt with in accordance with BS 1881. Prior to testing, the specimens shall be available for examination by the Engineer. If the cores are ordered to be taken solely or in part of reasons (a) and (d) above, the work involved and the testing shall be made at the Contractor’s own cost. If the cores are to be taken for reasons (b), (c) and (e) above, the Contractor will be reimbursed the cost if the loading test described in the previous paragraphs proves satisfactory.

Copies of Standards and Codes

The Contractor shall provide and keep permanently on the Site copies of the following British Standard Codes of Practice and Road Notes:-

		BS 812	
		BS	882
		BS	1478
		BS	1881
CP	110		
		BS	5337
		Road Note	4

The Contractor shall in addition provide and keep permanently on the site copies of such other Standards codes Notes and Specifications as may be approved by the Engineer in accordance with Clause 7 of the Notice of Tenderers.

310 WATER RETAINING STRUCTURES - SPECIAL CLAUSES

Note: In the event of any difference between the “Special Clauses” and the previous Specification under Section 3 then the provision of these “Special Clauses” shall have precedence.

310.1 Making Good

The cement mortar used in filling recesses in the concrete formed by bobbins in connection with shuttering shall contain an approved expanding admixture.

310.2 Construction joints in Water Retaining Structures.

310.2.1 In water retaining structures PVC water stops not less than 130mm wide manufactured by an approved manufacturer shall be built into all construction joints in floors all vertical construction joints in walls which are exposed externally and construction joints in roofs of potable water retaining structures. Construction joints shall be formed at positions agreed by the Engineer.

310.2.2 The cost of forming construction joints shall be included for by the Contractor in his general concrete rates

310.3 Water tightness of Structures

The contractor shall be solely responsible for the water tightness of structures and any remedial measures necessary.

SECTION 3A - TESTING AND STERILIZING CONCRETE WATER-RETAINING STRUCTURES

3A.1 TESTING OF WATER-RETAINING STRUCTURES

3A.1.1 all water-retaining structures shall be tested for water-tightness on completion in the following manner. The structure shall be filled with clean water in stages of one metre and held at each water level for such time as the Engineer may require. Should any dampness or leakage occur at any stage, the water shall be drawn off the defects remedied to the satisfaction of the Engineer.

The procedure shall be continued and finally the structure shall be allowed to remain full for three days during which the total permissible loss of water, after allowing for evaporation, shall not exceed 1/1000 of the capacity of the structure. Notwithstanding the satisfactory completion of the seven day test, should any dampness or leakage or other defects occur they shall be made good to the satisfaction of the Engineer and the structure re-tested until water-tightness is approved by the Engineer.

3A.1.2 The Contractor shall provide a hook gauge to measure variations in the water level during the tests.

3A.1.3 The testing shall be carried out before the excavations are backfilled and embankments placed.

3A.1.4 In the case of potable water reservoirs and tanks the roof shall be tested for water-tightness by flooding (in small areas at a time if necessary) to a minimum depth of 25 mm. The water shall be left standing for not less than 24 hours and the underside of the roof shall be made good by the Contractor and the tests continued until the water-tightness of the roof is approved by the Engineer. Where it is not practicable to contain a depth of 25mm of water over the roof, the roof shall be thoroughly wetted by continuous hosing for a period of six hours.

3A.1.5 The Contractor shall be solely responsible for the watertightness of structures and any remedial measures necessary.

3A.1.6 The water used for testing shall be provided at his own expense by the Contractor and shall be free from impurities and of such quality which will not pollute or impair the water-retaining structure.

3A.1.7 The Contractor shall give the Engineer's Representative at least 14 days notice as to the source of water intended for use for testing purposes.

3A.1.8 The Contractor shall be solely responsible for making all arrangements for obtaining water and provision of all equipment and labour and other things necessary for testing water retaining structures.

3A.2 CLEANSING AND STERILIZING WATER-RETAINING STRUCTURES

3A.2.1 The inside of all potable water-retaining structures and all interior pipe work and fittings shall be thoroughly cleaned and washed after the water-tightness test has been approved by the Engineer to remove all contamination and the water from these operations shall be removed by squeegees and drained away.

3A.2.2 The internal surfaces of the structure shall then be thoroughly washed with cleaned water containing 20 parts per million of chlorine. The chlorinated water shall then be drained away and the structure filled with potable water from which, after 24 hours, samples shall be taken for analysis to the instruction of the Engineer. If any of the results of the analyses are unsatisfactory when compared with those of the control sample of the supply water the sterilizing process shall be repeated until the results of the test are satisfactory.

3A.2.3. The costs of the initial sampling analysis and preparing reports on the bacteriological quality of the water shall be borne by the Employer but should initial reports be unsatisfactory the costs of any subsequent sampling analyses and preparing reports shall be borne by the Contractor.

TIME 3.8 SAMPLING, TESTING AND ACCEPTANCE STANDARDS

Materials

Materials	Test	Site Sampling		Testing Accepted Standards			Remarks
		On Site	In Laboratory	On Site	In Laboratory		
	1	2	3	4	5	6	7
CEMENT	Ordinary	Portland	Rapid	Hardening	Sulphate	Resisting	BS
4550	BS 12						
BS 12							
BS 4027		Manufacturers Test Certificate					
AGGREGATES		Description and Classification				BS 812 Section 2	
		BS 882 or 1201 Whichever is applicable					
	Particle size	BS B12 Sec.1	BS 812 Sec.5	-		BS 882 or 1201	
	Particle Shape	BS 812					
Sec. 1	Visual	BS 812 Sec.3					
	Sp. Gravity	BS 812 Sec.1	-	BS 812 Sec.5		Mix design	
	Density	BS 812 Sec.1	-	BS 812 Sec.3		Requirements	
	Voids	BS 812 Sec.1	-	BS 812 Sec.4			
	Absorbtion	BS 812 Sec.1	-	BS 812 Sec.4	US 5337 CI.21.2	See	
Freeze-							
	Organic Impurities		-	BS 812 Sec.5			
	Bulking of Fine Aggregate			CP 114			
CI 602		Nominal Mix Proportionary					
	Moisture Content			BS 812 Sec.5		For adjustment if	
added water for concrete making							
	Mechanical Properties			BS 812 Sec.6	BS 882 or 1201	Ten per cent	
finest value							

TABLE 3.8 SAMPLING, TESTING AND ACCEPTANCE STANDARD (Cont'd)

Materials	Test	Site Sampling	Testing Accepted Standards	Remarks		
		On site	In Laboratory			
Water for potable water	Suitability	BS 3148	-	BS 3148	BS 3148	Not required

Concrete	Compacting Factor Slump	BS 1881 Pt.1	BS 1881 Pt.2	BS	1881
Pt.2	This spec. Table1 C1.302	Workability Tests			
	Crushing	BS 1880 Pt.4	Table 2 this Spec.	Cube Test	
	Flexural	BS 1881 Pt.4	CP 114 CI.208c	As required	
	Water Absorption	CP 114	BS 1881 Pt.5	BS 340	Para 19(b)
	Precast Concrete	CI.308			
	Freeze-throw	CI.601 BS 1881 Pt.3			Durability test for
	aggregate not complying with moisture absorption requirements of BS 5337	CI.71.2			As required for salt
	Electrolytic Afflorescence				containing aggregate or saline water
	Corea	BS 1881 Pt.4	BS 1881 Pt.4	BS 1881 para 114 with ref. To	
	concrete at strength this specification	See Clause 306.2			
ADMIXTURES	Compatibility with cement			As required by Laboratory	
				Tests to be carried out by independent Laboratory as required.	

SECTION 4 :

PIPEWORK

401.	Valves Pipes Fittings and other materials.....	83
402.	Handling and Distribution of Pipes.....	83
403.	Stockpiling and Storage of Pipes and Fittings.....	84
404.	Proprietary joints and Couplings.....	84
405.	Flanged and Bolted Gland Joints.....	85
406.	Excavation of Trenches and Open Channels.....	85
407.	Timbering or sheeting.....	86
408.	Backfilling of Trenches.....	86
409.	Excavating and Backfilling trenches in 'Rock'.....	87
410.	Pipelaying General.....	87
411.	Examination of pipes prior to laying.....	87
412.	Laying and jointing pressure pipes.....	88
413.	Laying and Jointing Concrete Gravity Pipelines.....	90
414.	Concrete surround to pipelines.....	91
415.	Thrust and Anchor Blocks.....	91
416.	Flotation of Pipeline.....	91
417.	Fixing Valves and Penstocks.....	91
418.	Fixing Surface Boxes and Covers.....	91
419.	Grouting in Ironwork.....	91
420.	Proving Pipelines free from Obstruction.....	92
421.	Granular Bedding or Bed and Surround.....	92
422.	Pipelines on Concrete.....	94
423.	Flexibility in Pipelines.....	94
424.	Testing pressure pipelines.....	95
425.	Testing Gravity pipelines.....	96
426.	Painting.....	97
427.	Manholes and Chambers.....	97
428.	Channels and Benching.....	97
429.	Testing of Non-water-retaining structures.....	98
430.	Fixing of Manhole and inspection Frames and Covers.....	98
431.	Fixing Step Irons and other Fittings.....	99
432.	Pipes built in or through walls.....	99
433.	River Crossings.....	99
434.	Valves Penstocks etc.....	100
435.	Setting out of Lateral Drains and Junctions.....	105
436.	Concrete Pipes and Fittings.....	106

437.	uPVC Pipes and Fittings.....	106
438.	Ductile Iron Pipes and Fittings.....	107
439.	Steel pipes and Fitters	107
440.	Precast Concrete Invert Blocks.....	108
441.	Precast concrete paving slabs for open channels.....	109

PIPEWORK

401 VALVES PIPES FITTINGS AND OTHER MATERIALS

401.1 The Contractor shall supply all valves, pipes fittings and all other materials required for the proper execution of the Works in accordance with the Bill of Quantities.

Should it be necessary for the Contractor to supply additional valves pipes fittings or other materials besides those in the Bill of Quantities they shall conform with the Specifications or other detailed Specification which may be prepared by the Engineer.

402 HANDLING AND DISTRIBUTION OF PIPES

402.1 Loading unloading and handling shall be carried out using special lifting hooks with a curved plate to fit the curvature of the pipes etc. or webbing slings not less than 30 cm wide or other means approved by the Engineer's Representative. Sheathed pipes shall only be transported on trucks or trailers fitted with approved padded timber cradles shaped to fit the curvature of the pipes and of adequate dimensions so as to prevent any damage to the pipe sheathing. Successive tiers of sheathed pipes shall be separated by similar suitable shaped timber cradles when more than one tier of pipes is being transported. Pillows shall be provided between securing chains or lashing when loads are being transported.

402.2 HANDLING AND DISTRIBUTION OF PIPES

402.1 Loading unloading and handling shall be carried out using special lifting hooks with a curved plate to fit the curvature of the pipes etc. or webbing slings not less than 30cm wide or other means approved by the Engineer's Representative. Sheathed pipes shall only be transported on trucks or trailers fitted with approved padded timber cradles shaped to fit the curvature of the pipes and of adequate dimensions so as to prevent any damage to the pipe sheathing. Successive tiers of sheathed pipes shall be separated by similar suitable shaped timber cradles when more than one tier of pipes is being transported. Pillows shall be provided between securing chains of lashings when loads are being transported.

402.2 Particular care shall be taken during unloading, loading, handling and transportation to avoid distortion flattening denting scoring or any other damage to the piped fittings etc. and any damage to the external or internal coating sheathing or lining of the pipes fittings etc.

403 STOCKPILING AND STORAGE OF PIPES AND FITTINGS

403.1 When stockpiled shall not be stacked more than three tiers high without the Engineer's prior approval. The pipes shall be stacked clear of the ground on timbers of adequate dimensions or prevent any damage to the pipes or to external sheathing or coating and successive tiers shall be separated by timber of similarly adequate dimensions with wooden wedges nailed to the ends of these timbers to prevent the pipes from rolling. UPVC pipes shall be adequately protected from direct sunlight to the satisfaction of the Engineer.

403.2 Fittings etc. shall not be stacked more than one tier high and shall similarly be supported clear of the ground on timbers.

403.3 Pipe end covers wooden discs and other transit protections fixed by the pipe and other manufacturers shall be retained in place until the pipes etc. are inspected shortly before they re laid.

403.4 When pipes etc. are strung adjacent to the pipe trench prior to laying they shall be supported clear of the ground on suitable approved supports to prevent any damage to the pipes etc. or to external sheathing and coating and gaps shall be left at intervals and at well defined tracks and roads to permit the free passage of livestock vehicles and persons.

403.5 Air valves rubber joint rings gasket 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 fixing jointing or assembly 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's Representative.

404 PROPRIETARY JOINTS AND COUPLINGS

404.1 The Contractor shall make himself and his employees acquainted with and comply with the instructions issued by the manufacturers of the various types of proprietary joints and couplings supplied for incorporation in the works. The Contractor shall be responsible for obtaining copies of any such instructions.

404.2 All tools and apparatus necessary for making the joints and protecting them shall be provided by the Contractor.

405 FLANGED AND BOLTED GLAND JOINTS

405.1 Flanged and bolted gland type joints shall be made with the joint rings and nuts washers and bolts provided. Two washers shall be used per bolt one under the bolt head and the other under the nut. The tightening of the bolts shall be evenly done all round by tightening be exerted on any nut or bolt spanners shall be of a suitable length but not exceeding 300mm from the axis of the bolt to the extremity of the handle.

405.2 Spanners shall not be lengthened in any manner in order to increase the purchase. After the satisfactory conclusion of the watertightness test all buried joints shall be wrapped using "Density" mastic and "Densyl" Tape manufactured by Winn and Coales, Chapel Road, London, S.E. 27, or other approved wrapping in accordance with the manufacturer's instructions. All exposed flanged joints shall be cleaned and given two coats of an approved bituminous paint.

406 EXCAVATION OF TRENCHES AND OPEN CHANNELS

406.1 Trenches for pipes and channels shall be excavated to the lines and levels shown on the drawings or as directed by the Engineer. Trenches for pipes shall have a width at the bottom of the trench equal to or less than the widths given in Table 4.1 below or as directed by the Engineer. For concrete pipes the maximum trench width shall be the internal diameter plus 750mm.

TABLE 4.1
PERMISSIBLE MAXIMUM TRENCH WIDTHS (uPVC PIPES)

DIAMETER OF PIPE (mm)	MAXIMUM TRENCH WIDTH (mm)	MINIMUM TRENCH WIDTH (mm)
200 or LESS		

300
400
500
600
700
800 750
850
950
1050
1150
1250
1350 500
600
700
800
900
1000
1100

406.2 Excavations for open channels, inlet or outfall drains, catch water drains, subsoil pipe drains, and French drains shall be to the widths and depths shown on the drawings of as directed by the Engineer.

406.3 In the first instance excavation shall be to within 150mm of formation level and proper grade pegs shall then be set in the bottom of the trench by the Contractor for the accurate taking out of the rest of the excavation.

The bottom of trenches and open channels shall be excavated true to line and level and where pipes are to be laid without concrete beds holes shall be excavated under the joints to permit jointing. The bottom of the trench shall be smooth and free from stones and other projections

406.4 When directed by the Engineer, such as in the excavation of trenches in an existing road, the Contractor shall carefully set aside the various materials encountered so that they may be replaced in their original position.

406.5 Trenches shall be kept clean and free from water during the excavation, laying of pipes and backfilling and the contractor shall dig diversion channels, erect coffer dams or otherwise dewater the trench.

406.6 Where, in the opinion of the Engineer, any invert has become soft or unsuitable due to the Contractors method of working the Contractor shall at this own expense remove and replace the material with Class 15 Concrete or other imported material as directed by the Engineer.

406.7 Where any trench or open channel has been over excavated below the invert required, the Contractor shall at his own expense, backfill the trench with Class 15 concrete or other imported material, as directed by the Engineer.

407 TIMBERING OR SHEETING

407.1 The sides of trenches shall be supported, where necessary, by adequately shored and strutted timbering or sheeting, which shall be carefull removed when the trench is backfilled. The Engineer may direct the timbering or sheeting be left in the trench.

408 BACKFILLING OF TRENCHES

408.1 No sewer or culvert shall be covered up until approved by the Engineer.

408.2 Backfilling, where no concrete haunch or surround is called for, shall be of gravel material and/or selected fill material as directed by the Engineer.

408.3 Backfill material around the lower half of the barrel of the pipe and in the joint holes shall be watered or dried as necessary mixed, and compacted to 100% BS. Selected fill materials shall then be laid in layers, not exceeding 0.15m loose thickness, watered or dried as necessary, mixed, and compacted to 90% BS and brought up uniformly on both sides of the pipe up to the top of the trench.

408.4 Timbering and sheeting shall be eased up 0.15m at a time in step with the backfill layer and compaction of 90% BS shall be obtained under such timber and sheeting.

409 EXCAVATING AND BACKFILLING TRENCHES IN "ROCK"

409.1 Trenches in "rock" shall be excavated as described in Clause 406 but in addition shall be excavated to such a depth that everywhere the rock surface is not closer to the barrel or socket of the pipe than 75mm.

409.2 In the particular case of concrete pipes the invert of the trench shall be backfilled and smoothed with Class 10 concrete, or other material, as directed by the Engineer, so that the barrel or the pipes rests uniformly along its length and holes are left under the joints and sockets.

409.3 Trenches excavated in "rock" shall be backfilled as described in Clause 408 with imported material approved by the Engineer.

410 PIPELAYING GENERAL

410.1 Pipes shall be laid true to line by means of a string line stretched along the sides of the pipes and true to level by means of a straight edge of at least 4 metres long kept inside the pipes and pulled forward to pegs boned in at suitable intervals between sight rails set to the proper levels.

410.2 Where pipes are to be laid on 'normal' or imported material the floor of the trench shall be compacted and shaped so that the barrel rests over a width of the least one third of its diameter and throughout the length of the barrel upon the floor. Holes shall be excavated under the joints and sockets so that the sockets do not bear on the ground. The underside of the barrel and socket shall then be packed hard with earth or gravel fill material as directed by the Engineer and of maximum particle size not exceeding 25mm diameter and rammed solid. Refer to Clause 441 for the laying of uPVC pipes.

411 EXAMINATION OF PIPES PRIOR TO LAYING

Shortly before laying or fixing any valve pipe or fitting the contractor shall in the presence of the Engineer's Representative carefully examine each valve pipe and fitting as detailed in this Clause to ascertain damage or defect occasioned to the valves pipes and fittings during manufacture loading, unloading, handling and transportation. All damage and all defects revealed by this examination shall be repaired and remedied to the satisfaction of the Engineer's Representative.

411.2 The Contractor shall give the Engineer's Representative not less than 48 hours notice of his intention to examine any pipes etc. and the contractor shall not proceed to lay such pipes until they have been approved as free from damage and defects by the Engineer's Representative.

411.3 The ends of steel pipes and fittings shall be examined for circularity. Any distorted

ends shall be corrected by an approved method to within the tolerances required by the mechanical couplings or other joints by which the pipes or fittings are to be jointed.

411.4 In the case of the internal lining of steel pipes any surface cracks and crazing shall be made good by lightly flaming the areas with a blow lamp or torch sufficient to cause the bitumen to flow and fill in the cracks. In the case of loose patches the lining shall be removed from the affected areas and the bare metal cleaned and primed with the bituminous paint. The area shall then be filled in with hot bitumen moulding mixture and the surface smoothed with a metal tool to produce a uniform finish.

411.5 If ordered by the Engineer, the Contractor shall carry out inspection of the external sheathing of steel pipes with a "Holiday" detector immediately prior to laying and the contractor shall supply all necessary labour, tools, materials, and equipment for the carrying out of the "Holiday" detection test.

411.6 All ductile iron pipes and fittings which are severely dented or similarly damaged shall be discarded unless in the opinion of the Engineer's Representative a portion of such pipe or fitting may usefully be salvaged in which case the contractor may cut off and discard the damaged portion only.

411.7 Asbestos cement pipes and fittings shall be carefully examined for cracks damaged ends and any other defects. All pipes and fittings which are found to be cracked or which have any defect which in the opinion of the Engineer's Representative adversely affects their suitability for incorporation in the works shall be discarded. All damaged ends shall be cut off well beyond the damaged area and machined true.

411.8 All pre-stressed concrete pipes and fittings which may be damaged in the opinion of the Engineer's Representative in such a way as to adversely affect their suitability for incorporation in the Works shall be discarded. Pre-stressed concrete pipes and fittings shall on no account be cut.

411.9 All concrete pipes and fittings shall be slung vertically and "rung" with a wooden mallet. Any damaged or cracked pipe shall be rejected.

411.10 After examination and any necessary repairs and attention all pipes fittings etc. shall be cleaned internally particular care being taken to ensure that no stones etc. are bedded in bitumen or coal tar linings.

412 LAYING AND JOINTING PRESSURE PIPES

412.1 Immediately before any new pipe is lowered into the trench the plug to be provided in accordance with this clause shall be removed from the end of the last pipe laid and the new pipe shall be carefully lowered into the trench with a crane or gantry operating within its designed working load or by other approved means.

412.2 Each pipe and fitting shall be laid true to alignment curve and gradient in accordance with the Drawings or as directed by the Engineer's Representative. The minimum cover and the minimum gradient shall not be less than 0.6m and 1 in 500 respectively except by prior agreement with the Engineer.

412.3 Where gradients are slack or where invert levels are shown on the Drawings or where required by the Engineer's Representative the pipes shall be boned to even gradients and sight rails shall be provided for this purpose at intervals not exceeding 60m and at all changes in grade.

412.4 Long radius curves in the pipelines shall be negotiated by deflections taken up in the joints of one or more pipes. The deflection at each of the various type of joint used in the Works shall conform with the Manufacturer's recommendations and shall not exceed the following

Mechanical couplings	30
Bolted gland or “Tyton” joints	2.50
Joints on Asbestos Cement pipes	30

412.5 Pipes laid underground in trenches shall be laid and firmly bedded on an even and uniform bed and if considered necessary by the Engineer’s Representative fine screened material shall be placed and consolidated in the trench bottom to provide such bed. Pipes shall not be dragged along the trench bottom. Joint holes shall be as small as possible and shall be filled in compactly after pressure testing and before the refilling of the trench is completed.

412.6 Where pipes are to be laid above ground on piers or bridges the piers and bridges shall be constructed true to line and level and the pipes shall then be laid thereon jointed and firmly secured thereto in the manner shown on the Drawings.

412.7 Pipes shall be jointed with the joints and couplings supplied and each type of joint shall be made in full compliance with the manufacturer’s instructions. Special care shall be taken to ensure the absolute cleanliness of the pipe ends and joint components and only the lubricants recommended by the respective manufacturer shall be used. Should the Contractor require further quantities of joint lubricants or joints assemblies he shall supply them to the approval of the Engineer’s Representative and the Contractor shall bear the cost of supplying such additional lubricants or assemblies.

412.8 The Contractor shall take all steps necessary to ensure that no dirty water or other extraneous matter is allowed to enter the pipes during or after laying. In the event of dirty water or extraneous matter entering the pipes the Contractor shall immediately carry out the necessary cleansing as may be directed by the Engineer’s Representative. No extra payment will be made or allowed for such work.

412.9 Except when necessary for jointing the end of the last pipe laid shall be plugged to the satisfaction of the Engineer’s Representative and the Contractor shall provide a sufficient number of the use proper plugs for this purpose.

412.10 Pipe trenches shall not be refilled until permission to do so has been obtained from the Engineer’s Representative. Subject to such permission being obtained trenches shall be refilled without delay to at least the minimum extent required by Clause 424.3 hereof in readiness for pressure testing.

413 LAYING AND JOINTING CONCRETE GRAVITY PIPELINES

413.1 Rigid jointed pipes

Joints are to be made as detailed below. In all cases the joints shall be cured and protected from the wind, sun and rain by a covering approved by the Engineer and shall be kept constantly damp for a period of at least 3 days. All pipes shall be saturated with water before jointing.

413.2 For spigot and socket pipes yarn soaked in cement grout shall be called into the socket to a depth of between 10 and 20mm. 1:2 cement/sand mortar shall be rammed into the socket and finished off with a fillet at an angle of 45°.

413.3 For pipes with ogee or butt joints the fuses shall be thickly covered with 1:2 cement/sand mortar and the newly laid pipes shall be driven hard up to the previously laid pipes. The outside of the joint shall be pointed up with a fillet of 1:2 cement/sand mortar 75mm wide and 25mm thick all the way round the barrel and central over the joint.

413.4 Flexibly jointed pipes

For flexibility – joined concrete pipes the rubber rings used are to be thoroughly cleaned and

the joints are to be made in accordance with the manufacturer's instructions.

414 CONCRETE SURROUND TO PIPELINES

414.1 Where pipelines pass under streams and rivers or under roads the sections of pipeline under the stream river or road and for a minimum distance of 1.0m clear on either side of the bank or edge thereof or such greater distance as the Engineer's Representative may require shall be surrounded with Class 15 concrete in accordance with the typical detail shown on the Drawings so as to provide a minimum 150mm thickness protective surround to the pipe.

414.2 Similar class 15 concrete surround shall be provided elsewhere as may be required by the Engineer for the added protection of the pipeline at any point along the pipeline route.

415 THRUST AND ANCHOR BLOCKS

415.1 Concrete thrust and anchor blocks shall be formed at bends tees and valves in accordance with the typical sections shown on the Drawings or otherwise as directed by the Engineer. The additional excavation shall be made after the bends etc. have been jointed and the concrete shall then be placed with all possible speed. The back of supports and blocks shall abut on to solid ground all loose material being removed before concreting.

415.2 The concrete used for thrust and anchor blocks shall be Class 15 and after placing shall be kept in view for not less than six hours. No pressure shall be applied in any section of main until the concrete has had at least three days curing.

416 FLOTATION OF PIPELINE

416.1 The Contractor shall be solely responsible for ensuring that flotation of the pipeline does not occur during construction. The extent of the backfill placed over each pipe after laying and before testing shall be such as will prevent flotation of the pipeline and the requirements of Clause 424.3 hereof shall not be construed as limiting in any way the extent of the backfill so placed or which may be so required.

416.2 Should any section of the pipeline float out of line or level the section of pipeline so affected shall be removed and re-laid in accordance with the Specification to the satisfaction of the Engineer's Representative.

417 FIXING SURFACE BOXES AND PENSTOCKS

417.1 Valves penstocks and other fittings shall be securely fixed and where required extension spindles and headstocks shall be properly aligned and fixed in a vertical position. They shall be tested for ease of operation and water tightness and valve glands shall be repacked where necessary. Any damaged protective coating shall be made good and they shall be left clean in all respects.

418 FIXING SURFACE BOXES AND COVERS

418.1 Chamber covers and surface boxes shall be set in cement mortar to the correct levels camber and fall.

419 GROUTING IN IRONWORK

419.1 All brackets rag bolts and other ironwork for which holes have been boxed out or left in the concrete of structures shall be carefully grouted in to their correct positions in all particulars. The grouting in shall be carried out with cement and sand grout in such a manner that there shall be no apparent difference in the texture or colour throughout the face of the finished structure and there shall be no seepage of water either between the iron work and the set grout or between the set grout and the surrounding structure.

419.2 The above instructions shall apply also to the building in of pipes except that concrete of the class used for that part of the structure shall be used in lieu of cement grout.

420 PROVING PIPELINES FREE FROM OBSTRUCTION

420.1 After the pipelines have been completed and pressure tested satisfactorily in accordance with Clause 424 and 425 hereof the Contractor shall on the instructions of the Engineer's Representative prove the pipeline free from obstruction.

420.2 Proving shall be carried out by means of passing through the pipelines a "badger" which must be kept in the pipes during the time they are being laid. The badger must be pulled forward and the obstructions removed immediately after the laying of each pipe and before the next one is placed in position so that the barrel of the pipe is left perfectly clean and smooth.

421 GRANULAR BEDDING OR BED AND SURROUND

421.1 Sand or granular bedding material shall consist of approved local sand or non-flaky broken stone or gravel, graded 20mm nominal size, which materials shall have a compaction fraction ascertained by the test method described below of not greater than 0.15. The Contractor shall provide all necessary testing apparatus for the use of the Engineer's Representative on site. Frequency of tests shall be at the discretion of the Engineer's Representative.

421.2 Before placing pipe bedding material the trench bottom shall be prepared and all loose stones or lumps of clay, rock projections, boulders and other hard spots removed. The approved bedding material shall then be laid over the full width of the trench to such depth that after the pipes have been laid to line and level, the thickness of bed beneath the barrel of the pipes is not less than 150mm or as otherwise stated in the Bill of Quantities or on the drawings. The bedding material shall be evenly spread and carefully compacted and where the bedding beneath the pipe exceeds 200mm in thickness it shall be placed and compacted in two separate equal layers. Any clay, large stones, and other unsuitable material falling onto or into the bed from the trench sides or from any other source shall be immediately removed.

421.3 Timbering or any other form of trench support should be withdrawn, whenever possible, as the bedding material is placed so as to avoid disturbance of the bedding by later removal

421.4 Pipes shall be laid and jointed as specified elsewhere. Any adjustments to line and level must be made by adding or removing bedding material under the body of the pipe and not by wedging and blocking. All hard objects or timber shall be removed before laying the pipes.

421.5 After the pipes have been laid correctly to line and level the bedding material shall be brought up to half diameter of the pipe and compacted as before and so as to prevent any voids under the pipe barrel and give uniform support all round. Care shall be taken not to disturb the pipeline from its approved position at this stage and as the subsequent backfilling of the trench proceeds as specified elsewhere.

421.6 For P.V.C. pipe and where sand or granular surround is billed, the pipe shall then be covered with bedding material compacted as before to a depth of 150mm above the top of the pipe barrel.

421.7 Where ground water conditions are such that the bedding material would be likely to act as a carrier for ground water from higher to lower ground, the Engineer's Representative may instruct flow barriers of suitable selected earth to be inserted in lieu of bedding material.

Such barriers to be erected at reasonable intervals close to flexible joints in the pipe, without alteration of the rate for bedding etc.

Compaction Fraction Test

Apparatus required

- i) Open-ended cylinder 250mm long and 150+ 5 mm internal diameter (150mm diameter pipe is suitable)
- ii) Metal hammer with striking face 38mm diameter and weighing 1 kg.
- iii) Rule

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 in, 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 clean 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 of sample is left.

422 PIPE LINES ON CONCRETE

422.1 Where a concrete bed to pipes is to be provided the excavation shall be taken out to the proper depth to receive the concrete and the pipes shall then be laid to line and level and jointed on precast Class '15' concrete blocks solidly bedded on the floor of the trench. When the pipes are jointed the trench bottom shall be cleaned and the concrete for the benching, haunching or surround as the case may be shall be carefully placed under and around the pipes, special care being taken to pack the concrete solidly under the pipes.

422.2 The concrete bed and protection shall extend along the length of the pipe to within 100mm of the joint collar and a gap shall be left adjacent to the joint. This gap shall be backfilled with selected excavated material.

422.3 All precautions shall be taken to avoid damage to the pipes during the placing of the concrete. The precast blocks shall be not less than 300mm x 150mm x 100mm and shall be notched to receive the barrel of the pipe and shall be placed immediately behind the joints.

422.4 For pipes of 600mm dia. and over, and on ground of soft formation, the concrete bed shall be cast in two layers. A bed of 50mm thickness shall be placed to receive the concrete

blocks and after the pipes are jointed the remainder of the bed shall be cast.

423 FLEXIBILITIES IN PIPELINES

423.1 All flexibly jointed pipelines shall be provided with additional flexibility between any structures, chamber, manholes, fixed points etc. and the remainder of pipeline.

423.2 Unless otherwise shown on the drawings the first joint shall not be more than 1.0m from the external face of the structure, chamber, manhole, fixed point etc. and the next joint shall not be more than 2.5m from the first joint.

423.3 The provision of the necessary short pipe lengths and additional flexible shall be included for in the rates for the pipeline.

424 TESTING PRESSURE PIPELINES

424.1 All pipelines shall be hydrostatically tested in the presence of the Engineer's Representative after laying.

424.2 The Contractor shall give the Engineer's Representative not less than 48 hours' notice of his intention to carry out a pressure test.

424.3 Before any pressure is applied to any pipeline each pipe shall be securely anchored and when in trench shall be covered for at least two-thirds of its length with not less than 60cm. Of the backfill material leaving the joints exposed. No joint shall be backfilled or moulded or covered in any way until after the satisfactory completion of the pressure test.

424.4 Pressure testing shall be carried out as the work proceeds in such lengths of pipeline as re convenient and meet the approval of the Engineer's Representative. The ends of the length of pipeline under test shall be closed by means of caps or blank flanges. Pipeline sluice 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. The Contractor shall be solely responsible for the provision of all caps and blank flanges necessary for testing of the pipeline.

424.5 The test pressure in the section of the pipeline to be tested shall be the test pressure head level shown on the Drawings or other pressure as directed by the Engineer. The pressure in the pipeline shall be slowly raised to the test pressure the test pump disconnected and the pipeline left charged under pressure with all air valves open 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 the test pump shall be reconnected and the pressure in the pipeline shall not be allowed to fall or rise more than 6m head of water below or 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 form the pipeline shall be carefully measured. At the end of the test period of 24 hours the pressure in the pipeline shall be adjusted to the test pressure by pumping water into or releasing water from the pipeline as required.

424.6 The leakage from the pipeline shall be ascertained from the net volume of water that has been pumped into the pipeline during the test period of 24 hours. The leakage so ascertained shall not exceed the volume determined by the following formula.

3 litres per kilometre of pipe per 25mm. of nominal bore per 3kgf/cm² of pressure per 24 hours.

424.7 During the period of the pressure test all joints shall be inspected for water tightness. All signs of leakage or faults shall be remedied whether total leakage from the pipeline under test is less than the allowable leakage or not.

424.8 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 any remedy the faults and to retest the pipeline until it satisfactorily passes the test.

424.9 After the completion of pipe laying and installation of all fittings valves etc. the

complete pipeline shall be subjected to a hydrostatic test under this test pressure the complete pipeline shall be inspected in the presence of the Engineer's Representative and all faults revealed shall be remedied to his satisfaction.

424.10 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 pipelines and to the satisfaction of the Engineer's Representative.

424.11 The Engineer's decision shall be final in all matters relating to pressure testing.

425 TESTING GRAVITY PIPELINES

425.1 Gravity pipelines shall be watertight and shall not admit infiltration. They shall be tested by the Contractor in the presence of the Engineer during the progress of the work at the completion of same and if so instructed immediately prior to payment of the retention money or at any time as the Engineer may direct. The Contractor shall remedy and defective or leaky pipes, chambers, etc., and remove all dirt, silt or other matter of obstructions from them.

425.2 All gravity pipelines shall be water-tested under a minimum head of 1m or to twice the height of the maximum ground water level as decided by the Engineer. In either case the pipelines shall be watertight. If permitted by the Engineer they may be alternatively tested by air under an initial pressure of 100mm. head of water and the test of water and the test shall be deemed to be satisfactory provided that the loss of head is not greater than 25mm. in five minutes.

425.3 In every case the water used for testing the pipelines shall be left in the pipes until they are covered with earth or other trench filling material to a depth of at least 1.2m over the top of the pipes and until permission is given by the Engineer for the water to be released. If after the Engineer has approved of the pipelines and has given permission for the trenches to be refilled the pipes become damaged and lose water from any cause and/or admit sub-soil water the contractor shall have the pipes uncovered and the defect made good and the pipelines retested as before to the satisfaction of the Engineer and all at the Contractor's sole expense.

425.4 The Contractor shall provide all water, labour, drain stoppers, bends, and other needful appliances for carrying out tests and no pipes or other work must be covered up until they have been seen and passed by the Engineer. The Contractor shall allow for testing and all associated work in his pipe laying rates.

426 PAINTING

426.1 All pipes and fittings exposed to view shall be painted after making good the manufacturer's primer or shop coat with two coats of "Bitumastic Aluminium Solution D. 5909" manufactured by Wailes Dove Bitumastic Ltd., Hebburn, Country Durham, England, or other approved paint.

426.2 Steel Pipes and fittings in manholes or chambers shall be painted with two coats of "Bituros Solution" manufactured by Wailes Dove Bitumastic Ltd., or other approved paint. Valves and surface boxes shall be similarly painted.

427 MANHOLES AND CHAMBERS

427.1 Manholes and chambers shall be constructed in accordance with the standard manhole detail drawings. Where the Contractor wishes to construct manholes or chambers other than in accordance with the said drawings he shall submit details to the Engineer for his approval at least 14 days prior to the intended date of commencement of construction.

427.2 The incoming and outgoing lengths of pipes shall terminate at the internal face of the concrete with spigot ends which in the case of concrete pipes shall not be cut ends. The concrete surrounding the spigot ends shall be placed in the single operation to at least 150mm. over the top of the pipes for the full thickness of the wall and the whole of the base wall brought up to the same level. The concrete shall be of a minimum thickness of 40mm. between the pipe and structural floor and particular care shall be taken to ensure that the concrete completely fill the

spaces beneath pipes and that a sound joint is made all round each pipe.

427.3 Access opening to manholes shall be sited on the downstream side of manholes unless another position is necessary for accommodating the rodding-eye of a backdrop.

Manholes and chambers are no necessary to be placed centrally over pipelines but shall be so located that the best use can be made of the area of the bottom of the manhole of chamber when arranging channels, particular regard being paid to backdrop.

428 CHANNELS AND BENCHES

428.1 Channels in manholes and chambers are to be formed in Class '20' concrete benching finished with 50mm, minimum Class '20' fine concrete or as directed by the Engineer. The invert of the channel is to be formed to a fall not less than the lesser gradient of the two adjacent pipelines. All branch drains are to be connected to the main channel with half-channel branches of a proper angle and radius to lead into the run of the main channel the bends being as "slow" as possible.

428.2 Sides of channels and benchings are to be finished with 50mm thick Class '20' fine concrete and all shall be homogeneous. Special care shall be taken to produce perfectly smooth finish all over and to ensure the uniformity of the slope of the benching of the top of the nosing and of the invert and that proper clearance is given round valves, penstocks and other fittings.

428.3 Sides of channels shall be carried up vertically above the half round channel and shall join the benchings with nosings of 25mm. radius. Benchings shall rise at a slope of one in six from the edge of the main channel starting from an assumed line between the crowns of the incoming and outgoing pipes. Inverts sides of channels and benchings of each manhole are to be completed before the chamber slab is placed in position.

429 TESTING OF NON-WATER RETAINING STRUCTURES

429.1 Manhole chambers and other non-water retaining structures shall be watertight. The Contractor shall if so required test them in the presence of the Engineer.

429.2 The Contractor shall provide all water, labour, drain stoppers, bends and other needful appliance for carrying out tests and no work must be covered up until it has been seen and passed by the Engineer. The test to be applied to chambers of manholes and other chambers shall be the filling of the chambers with water to 75mm. above the slab or to ground level respectively and after giving due time for saturation of the concrete shall be topped up to the original level. Thereafter the loss shall not be greater than the equivalent of 12mm, over the whole area of the chamber in 24 hours.

429.3 All covers and frames with recessed seating or which are close fitting have the edges thoroughly greased before the plug is put into the frame, if necessary all edges shall be re-cleaned and re-greased at the completion of the Works.

430 FIXING OF MANHOLE AND INSPECTION FRAMES AND COVERS

430.1 Before being incorporated in the work all manholes and inspection frames and covers shall be thoroughly including the removal of all grease and rust and shall then be coated immediately with an approved bituminous of other compound.

430.2 The frames of manhole and inspection covers shall be set in roads paths etc. so that the cover shall be flush with the surface of the road or path and elsewhere 250mm proud of the surrounding ground, one or more courses as may be required of concrete blocks shall be used to adjust the level of the frames and the whole shall be set in and on 1;3 cement mortar.

430.3 All covers and frames with recessed seating or which are close fitting shall have the

edges thoroughly greased before the plug is put into the frame. If necessary all edges shall be re-cleaned and re-greased at the completion of the works.

431. FIXING STEP IRONS AND OTHER FITTINGS

431.1 Step irons shall be of galvanised malleable irons and comply in all particulars to B.S. 1247.

431.2 All step irons shall be built in as the work proceeds and shall be staggered 300mm. apart horizontally and be 300mm apart vertically. The lugs on the underside of step irons shall only be permitted where it is impossible to build them in as the concrete is being cast.

431.3 When a valve or penstock is to be built into a manhole of chamber the necessary bolts and frames are to be placed in position of built in as the work proceeds.

432. PES BUILT IN OR THROUGH WALLS

432.1 Pipes shall be built in as work proceeds. Where this is not practicable or the Engineer shall have given instructions to the contrary, pipes shall be built in subsequently. In such cases and where in particular pipes have rigid couplings care shall be taken in setting them to ensure that after the concrete has been cast around the pipes all adjacent pipes can be coupled up without strain on the joints. Care shall be also be exercised to ensure that puddle flanges are in the correct position.

432.2 Pipe work passing through walls for which holes have been boxed out shall be jointed completely and then tested before other pipes are finally concreted into the walls.

433. RIVER CROSSINGS

433.1 Payment for referenced river crossings will be made in accordance with the tendered rates for the respective works included in the relevant section of the Bill. The Contractor shall in addition be entitled to extra payment in the form of a single fixed lump sum for each of the referenced crossings which sum shall be deemed to be inclusive of all additional costs and expenses incurred or arising on account of river diversion works difficulty of access the handling and laying pipes etc. on piers the provision of scaffolding and all other matters or things which affect or influence the cost of completing each crossing and no variation in any of the fixed sums will be permitted on account of adverse weather conditions increased flow of a water in rivers and streams or any other thing resulting in the work being or greater difficulty or of longer duration than provided for by the Contractor.

434. VALVES, PENSTOCKS ETC

434.1 General

434.1.1 All valves and penstocks shall be the best of their respective kinds and shall be obtained from an approved manufacturer.

434.1.2 All sluice valve with extended spindles shall be provided with suitable indication to show that 'fully open' and 'fully closed' positions. This indication shall be easily visible from the operating position.

434.1.3 All flanges on all valves shall be BS 4622 type NP 16 unless otherwise stated.

434.1.4 All items of aluminium construction shall be isolated from concrete by the use of bituminous felt or D.P.C. material or two coats of bituminous paint. All aluminium shall be isolated from dissimilar metal by the use of fibre washers and spacers.

434.2 Sluice Valves

434.2.1 Sluice valves shall be double flanged unless otherwise specified and shall comply with BS 5150, 5151, and 5163 as appropriate. They shall be suitable for a maximum working pressure of 915 Kpa.

434.2.2 Each sluice valve shall have a drain plug fitted at the bottom of its seating so that accumulations of silt may be removed. Spindles shall be of the non-rising type and screwed so as to close the valves when rotated in a clockwise direction.

434.2.3 Valves shall be both open-end and closed-end tested.

434.2.4 All sluice valves shall have body marked with cast on or stamped lettering giving the following information:-

- (a) The manufacturer's name or trade mark
- (b) The working pressure in metres head of water for which the valve is suitable.
- (c) The nominal size of the valve in millimetres.

434.3 Check Valves

434.3.1 Check valves shall comply with BS 5153:1974 and shall be double flanged swing check valves with cast iron body having the following features:-

- (i) Detachable cover-plate of ample dimensions to facilitate inspection and withdrawal of the flap.
- (ii) Cast iron disc to close on to gunmetal seats at an angle of not more than 80° to the axis of the pipe
- (iii) An ample pocket below the flap into which may fall any solid matter which might otherwise prevent the flap from closing.
- (iv) Suitable stops or other means to prevent the flaps from opening to an angle of less than 30° with the axis of the pipe.
- (v) Hinged pin of gunmetal or stainless steel and extended on one side of the valve casing through a gunmetal bushed gland, and fitted with mild steel external lever.
- (vi) Gunmetal drain plug fitted at the bottom of the body.

434.3.2 The maximum velocity through any check valve shall not be greater than 2.5 metres per second and they shall therefore be suitably sized to meet this condition.

434.4 Sludge Valves

434.4.1 Sludge valves shall be the screw operated type and have gunmetal faces, forged bronze spindles, gunmetal nuts, and bushes. The body, bridge, and door shall be in cast iron with the body of the valve terminating in a flange drilled to BS 4622 type NP 16.

434.5 Flap Valves

434.5.1 All flap valves shall be of flat-back, double hung type.

434.5.2 Flap valve frames and doors shall be of either best quality cast iron with gunmetal sealing faces and bronze hinge pins, or of aluminium alloy NP8 plate to BS 1477 and NE8 extrusions to BS 1474 with approved seating arrangements, hinges, fittings and fixings or of approved composite plastic construction.

434.6 Telescopic Valves

434.6.1 Telescopic valves or bell mouths, shall consist of high quality cast iron stand pipe with an easy sliding non-ferrous tube and cast iron discharge bell mouth or shall be approved plastic construction. The joint between the standpipe and sliding tube shall be sealed with a gland.

The sliding tube shall be complete with guide rods.

434.6.2 The base of the standpipe shall be flanged to BS 4622 NP 16.

434.7 Hand stops

434.7.1 Hand stops and frames shall be of galvanised mild steel, aluminium alloy NP8 and NE8 or approved composite plastic construction. Doors greater than 300mm wide shall have two lighting handles. Aluminium and galvanised mild hand stops shall have nylon inserts or guides and neoprene seals.

434.8 Penstocks

434.8.1 All penstocks shall be of the fiat-back type and shall be watertight, when tested to 90 Kpa head and to reverse pressure as particularly specified.

434.8.2 Penstock frames and doors shall be of either best quality cast iron with two gunmetal faces, aluminium alloy NP 8, plate to BS 1474 or shall be of approved plastic construction.

434.8.3 An adequate number of cast iron wedges shall be provided on the doors and adjustable suitably faced wedge blocks as necessary fixed to the frame. The frame shall be of substantial construction.

434.8.4 All penstocks shall be provided with mild steel spindles screwed for clockwise closing and running in a suitable nut housed in the head gear which shall have a handwheel or key for operation as indicated.

434.8.5 Suitable gearing or anti-friction devices such as ball-bearing thrust collars shall be provided as necessary to enable each penstock to be operated from the closed position by a 13kg 'push-pull' effort (total 26kg) at the rim of the handwheel or tee key. All penstocks fitted with headstocks shall be supplied with rising spindles except where otherwise indicated.

434.8.6 Where specified or shown on the drawings level invert penstocks shall be used and shall have a flush invert with adequate sealing arrangements.

434.8.7 Weir penstocks shall have a perfectly level cill and shall be complete with top seal unless otherwise stated.

434.8.8 All penstocks shall be supplied complete with all necessary nuts, bolts or studs and washers for fixing in position.

434.9 Headstocks

434.9.1 Any headstock required shall be of cast iron complete with a gunmetal index pointer working over a polished and graduated gunmetal indicator plate which shall be fixed to the side of the pillar. The pillar shall not be drilled for fixing. Bevel gearing, when required, shall be provided in a totally enclosed oil bath, or grease lubricated bevel gear housing.

434.9.2 Cast Iron footplate brackets shall be provided where indicated for penstocks of less than 0.3m² opening.

434.9.3 Galvanized Mild Steel flanged spacer tubes shall be provided where indicated and shall support the headstock from the penstock frame.

434.10 Hand wheels

434.10.1 All hand wheels shall be of best quality cast iron with completely smooth and

rounded rims and marked thereon with direction of opening.

All valves and penstocks shall open by an anti-clockwise rotation of the wheel or turn key.

434.11 Extension Spindles

434.11.1 Extension spindles shall be of mild steel, sherardized or hot dip galvanized with the threaded portion left untreated.

434.11.2 Where indicated universal joints of approved type shall be provided to allow offsetting of the extension spindles.

434.11.3 Spindle lengths as given in the Bill of Quantities are measured from the inverts of the pipes or openings to the top of the squared end of the spindle or to the base of the headstock pillar as the case may be, unless otherwise indicated.

434.12 Guide Brackets

434.12.1 Guide brackets shall be of the cast iron split bearing type, and shall be built into the wall. The maximum spacing between brackets shall not be greater than 1500mm.

434.13 Key heads

434.13.1 Key-operated valves and penstocks shall be provided with cast iron caps to spindles.

434.14 Operating Keys, Spares and Special Tools

434.14.1 The Contractor shall include for operating keys, spares, and special tools. The spares shall suffice for 24 months operations. Operating keys shall be supplied for each key head up to a maximum of 6 No. in any one range.

434.15 Swivel Draw-off Arms

434.15.1 Swivel draw-off arms shall consist of a galvanized mild steel or approved plastic tube, cast iron bend and support pillar. The bend shall swivel on a watertight bronze or neoprene sealing gland at one end, a bronze pin fitted into the support pillar at the other. The cast iron support pillar shall be bolted to the floor of the tank or chamber.

434.15.2 The draw-off arm shall be raised or lowered by means of stainless steel cable operating over a gear winch, which shall incorporate a locking device, or by rising mild steel spindles with indicating capstan pillars as specified.

434.16 Fixing

434.16.1 All bolts, nuts, washers and foundation bolts with expanding shells shall be cadmium plated.

434.17 Testing

434.17.1 The performance of each unit shall be tested at the Supplier's Works in accordance with the conditions stipulated in the appropriate British Standards and to the requirements of the Engineer's Representative.

434.17.2 The acceptance by the Engineer's Representative of equipment after testing at

the Supplier's works shall in no way relieve the Contractor of his responsibility for the performance of the equipment after erection.

434.18 Air Valves

434.18.1 Single orifice air valves shall be of the single acting type for the automatic admission and discharge of either large quantities of air during main emptying or filling or small quantities of air under pressure during normal working conditions of the main.

434.18.2 Each single orifice air valve shall be complete with an isolating valve or cock.

434.18.3 Double orifice air valves shall be of the double acting type suitable for the automatic admission and discharge of bulk volumes of air during drainage and filling of the main, and for the release of small quantities of air during normal working conditions of the main.

434.18.4 Each double-orifice air valve shall be provided with a screw-down valve for isolating purposes. Isolating valves shall have gunmetal seats and stoppers and forged bronze spindles fitted with cast iron caps for key operation. The spindles of the isolating valves shall be screwed so as to close the valve when rotated in a clockwise direction. The isolating valves shall be suitable for manual operation against the maximum working pressure.

434.18.5 The design of the double-orifice air valves shall be such that the balls do not blow shut under any working or test conditions when large volumes of air are being released.

434.18.6 All double-orifice air valves shall be flanged. Flanges shall be faced and drilled and shall conform to the dimensions specified in B.S. 4504 tables for NP 10 unless otherwise stated.

434.18.7 All double-orifice air valves shall be supplied drilled with a 20mm. dia. hole tapped British Standard pipe. Thread suitable for fixing of a pressure gauge. Holes shall be fitted with a brass screwed plug and copper compression ring gasket.

434.18.8 Each air valve shall be suitable for the maximum working pressure stated in the Bill of Quantities.

434.18.9 Each air valve body shall be marked with cast-on or stamped lettering giving the following information:-

- (a) Manufacturer's name or trade mark
- (b) Working pressure in metres head of water
- (c) Size of air valve in millimetres

434.18.10 The air valves are likely to be exposed to tropical sun temperatures and the balls and other parts shall be suitable for these conditions.

435 uPVC PIPES AND FITTINGS

435.1 Pressure pipes

Unplasticised polyvinyl chloride pressure pipes and fittings shall comply with the latest revision of BS 3505 (1968) 'Unplasticised PVC pipe for cold water services' and BS 4344 Part 2 (1970), "Mechanical joints and fittings principally of unplasticised PVC".

435.2 Gravity Pipes

Unplasticised polyvinyl chloride pipes and fittings shall generally comply with the latest revision of BS 5481:1977, 'Specification of uPVC pipe and fittings for gravity sewers' and B.S. 4660:1973, 'uPVC underground drain pipe and fittings'.

Pipes shall have a S.D.R. of 41 or 34

Class B pipes to B.S. 3505:1968, 'Specification for Unplasticized PVC pipe for cold water services' shall be acceptable for S.D.R. 41 pipes.

435.3 General

Each pipe and fitting shall be supplied with 1 No. flexible joint.

Flexible joints shall be either:-

- (a) of the unplasticised PVC sleeve or integral socket type and shall comply with BS 4355 Part 2 (1970)
- (b) Couplings of the Dresser, Viking Johnson or similar mechanical type providing they meet the requirement of Clause of this specification.

Solvent cement joints are not acceptable.

438 DUCTILE IRON PIPES AND FITTINGS

438.1 Ductile Iron pipes and fittings shall comply with the latest edition of BS 4772 (1971), 'Ductile Iron pipes and Fittings'.

Unless otherwise described all pipes and fittings shall be supplied with flexible joints of an approved type.

439 STEEL PIPES AND FITTERS

439.1 Standard of Manufacture

Steel pipes shall comply with BS 3601:19878 – Steel Pipes and Tubes, while fittings will conform to BS 534:1990 (dimensions) and AWWA C208-59 (reinforcing). Flanges will be to BS 4504:1989.

Flexible joints shall be by use of flexible coupling of approved pattern. Pipe for use with flexible coupling shall be true ended with pipe ends appropriately prepared for the type of coupling proposed.

439.2 Steel Grade, Minimum Wall Thickness, and Working pressures

The steel pipes shall be PN16 manufactured from steel grade B of yield stress not less than 235N/mm² and able to withstand working pressure up to 200 meters water column (i.e. 20 Bars).

The minimum wall thickness shall be as follows:

Pipe (N.D) Diameter (mm)	Minimum Wall Thickness (mm)
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50	2.5
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SECTION 5

BUILDERS WORK

INDEX

500	GENERAL.....	111
501	DAMP PROOFING.....	111
502	CEMENT.....	111
503	CEMENT MORTAR.....	111
504	RENDERING.....	112
505	BLOCKWORK.....	113
506	MASONRY.....	114
507	BUILDING PAPER.....	114
508	PRECAST CONCRETE PATHS.....	114
509	IRONMONGERY.....	114
510	PAINTING.....	114
511	GALVANISED STEEL TUBES WITH SCREWED JOINTS.....	114
512	TIMBER.....	115
513	CARPENTRY.....	115
514	JOINERY.....	116
515	PRESERVATIVE TREATMENT OF TIMBER.....	116
516	PLUMBING.....	116
517	SANITARY INSTALLATIONS.....	117
518	METAL DOORS, DOOR FRAMES, WINDOWS ND LOUVRES.....	118
519	FLOORS.....	118
520	TERRAZZO.....	119
521	GRANOLITHIC FLOORING.....	119
522	PVC FLOOR TILES.....	120
523	WOOD BLOCK FLOORING.....	120
524	PVC FLOOR TILES.....	121
525	WOOD BLOCK FLOORING.....	121
526	PLASTERING.....	121
527	TYROLEAN FINISH.....	122
528	ROOFS.....	122
529	ROOF TILES.....	123
530	FLATROOF WATERPROOFING - PREPARATION WORK.....	123
531	FLATROOF WATERPROOFING - FILLING JOINTS.....	123
532	FLATROOF WATERPROOFING - TREATMENT.....	124

BUILDERS WORK

500 GENERAL

500.1 The Contractor shall construct the building as shown on the drawings in conformity with the Specification. Where any particular material, good, or method of fixing or construction is not specified the Controller shall seek the approval of the Engineer.

500.2 The Contractor shall at all times use the best available materials and use only suitable and well established methods of construction, and shall ensure that the construction is in accordance with the Building Regulations of Kenya.

501 DAMP PROOFING

501.1 A bituminous damp proof layer shall be inserted in the walls in accordance with the drawings, and shall be a bitumen impregnated fibre complying with BS 743, to be not less than 150mm above the finished ground level. Before applying the DPC, all surfaces must be clean and free from dust, dirt, grease and loose material.

501.2 Bituminous damp proof courses shall be laid with laps of not less than 75mm and bedded solidly in cement mortar and with the exposed edges pointed.

501.3 A polythene vapour barrier shall be laid on the blinding to all floors which shall first be screeded with 25mm thickness of fine sand or as detailed on the Drawings. Joints shall be made with a suitable adhesive in a welded lap joint.

501.4 Alternatively the blinding may be given not less than four coats of a suitable bitumen emulsion to give a thickness of not less than 2 mm.

502 CEMENT

502.1 The cement used for mortar rendering grout screeding and other construction work shall be in accordance with the specified in Section 3.

503 CEMENT MORTAR

503.1 Cement mortar for blockwork, masonry, rendering, tiling, screeding, pitching and jointing concrete pipes shall consist of Ordinary Portland cement and natural sand mixed by hand or an approved mechanical mixer in the proportions by volume of one part cement to three parts sand. The cement and sand shall first be mixed dry until the cement colour can no longer be distinguished from the sand in any part of the mass and the whole shall then be uniformly wetted by approved means while undergoing further mixing. The water content shall be just sufficient to ensure a dense mortar of still consistency and adequate workability to permit trowelling or floating into place.

The workability of cement mortar to be used for rendering may be improved by adding an approved plasticiser in the proportions recommended by the supplier of the plasticiser.

503.2 Mortar shall be prepared and used in such quantities that no more than 20 minutes shall elapse between first wetting and its completed use. Under no circumstances shall any mortar that has stiffened by commencing to set be used. Fresh mortar shall not be mixed with mortar prepared earlier and all batches shall be used entirely separately.

503.3 Sand for cement mortar to be used for rendering shall comply with BS 1199. Sand for cement mortar for all other uses shall comply with BS 1200.

503.4 Water used for cement mortar, rendering, grout, screeding and other construction work shall be in accordance with that specified in Section 3.

504 RENDERING

504.1 Surfaces to receive a finishing coat of rendering shall be thoroughly cleaned. Concrete surfaces shall be roughened by treating the formwork with an approved retarder and wire brushing after removing the formwork whilst the concrete is still green to form an adequate key. Alternatively concrete surfaces shall be treated with an approved cement bonding agent in accordance with the manufacturer's recommendation.

504.2 Rendering shall consist of cement mortar with an approved plasticiser used as and in the proportions directed by the manufacturers and approved by the Engineer.

504.3 All surfaces shall be dampened as necessary and the rendering applied immediately afterwards. The rendering shall be applied in two coats of 20mm total thickness. The undercoat

which shall have a thickness of 12mm shall be roughened to provide an adequate key for the finishing coat. A strip of expanded metal not less than 50mm wide and conforming to BS 405 shall be set in the undercoat at all joints between different surfaces being rendered (eg concrete/blockwork) and across all chases of electrical and similar services.

504.4 The finishing coat shall be applied with a wood skimming float and afterwards trimmed with a feather edge rule to a true and even surface. The surface shall then be thoroughly scoured with a hand float and any inequalities filled in. Overworking of the surface shall be avoided to reduce the tendency of surface crazing.

504.5 All rendering shall be protected from sun and rain by adequate and suitable coverings and the rendering shall be kept damp while setting. Any cracks or parts which sound hollow when tapped or other defects in the rendering shall be cut out and re-rendered.

505 BLOCKWORK

505.1 Precast concrete blocks for blockwork shall be solid blocks or hollow blocks manufactured from Ordinary Portland cement as specified for concrete in Section 3 and aggregates conforming to BS 882. All blocks shall be manufactured mechanically by compression and vibration. The mix used shall be not richer than one part cement to six parts of combined fine and coarse aggregate by volume. Blocks shall be dried for 24 hours after which curing shall start for a period of not less than 10 days. After curing all blocks shall be grouped carefully stacked and shall not be laid before 28 days after casting. All blocks shall be cast in clean moulds of accurate shape and dimensions. The tolerance on all dimensions shall be +/- 3mm and no membrane or web of any block shall be less than 40mm. Unless otherwise stated on the Drawings, solid blocks shall attain a strength not less than 3.5 N/mm² after 28 days and hollow blocks shall attain a strength not less than 3.0 N/mm² on the real area after 28 days.

505.2 All blocks shall be handled and stacked with care. The blocks shall be stacked protected from rain by a cover and in such a way that air circulates around them. No broken block or block of improper quality shall be used.

505.3 All blockwork shall be bonded pointed and uniformly bedded in true horizontal courses in cement mortar and built true to line and profile. Blockwork shall be carried up evenly and in regular stages and no part shall be raised more than 1m above any other part of work at any time. All blocks shall be well soaked before use and the top of unfinished walls wetted and raked back before work is recommended. All blockwork shall be built with vertical shall exceed 12mm thickness. Courses shall be properly levelled and perpendicular joints, quoins, jambs and angles shall be plumbed as the work proceeds.

505.4 Blockwork which is not to be rendered shall be finished with a fair face and the blocks shall be selected for even texture and unmarked faces regular shape and square unbroken arises. The blockwork shall be pointed as the work proceeds with a neat joint as required by the Engineer's Representative. Where blockwork is to be rendered the joint shall be raked out 12mm deep as the work proceeds to form an adequate key.

505.5 Blockwork shall be bonded to concrete columns and walls by approved galvanized metal ties cast into the concrete spaced at alternate courses and extending not less than 150mm into the block joints.

505.6 In unreinforced blockwork the block cavities shall be filled with Class 20 fine concrete.

505.7 In reinforced blockwork the block cavities shall be similarly filled with Class 20 fine concrete and reinforced with steel bars as detailed on the Drawings.

505.8 Chases shall be cut as necessary for services but no excessive cutting will be permitted. Chases shall be made good after the erection of services by building in pieces of block or

mortar.

506 MASONRY

506.1 Masonry shall be constructed from approved hard durable stone laid to bond. The stones shall be rough dressed so that the beds and sides are roughly perpendicular to the exposed face of the wall. The joints shall be 12mm thick on the average and completely filled with mortar. The face of the work shall be true to profile and the joints shall be neatly pointed in mortar.

506.2 Where the walls are to be rendered the joints shall be raked out to a depth of 12mm to form a key.

SECTION 7

FENCING

205	INDEX	
206	GENERAL REQUIREMENTS.....	136
207	CONCRETE POSTS FOR CHAIN LINK FENCING.....	136
208	CHAIN LINK FENCE.....	137
209	BARBED WIRE FENCING ON WOODEN POSTS.....	138
210	GATES.....	139

SECTION 7 - FENCING

700 GENERAL REQUIREMENTS

700.1 Erection

As soon as the Contractor is placed in possession of any part of the site he shall immediately erect fencing on the boundaries of the land where shown on the Drawings. In places where permanent fencing cannot be erected immediately, or where none is required, the Contractors shall, as directed by the Engineer, erect, and when and where required re-erect and maintain temporary fencing as is necessary for the proper protection of the works.

700.2 Access

Provision shall be made in temporary fencing for Access, where directed by the Engineer, for the use of owners, tenants and any other occupiers of the 'adjacent lands. Temporary fencing shall remain in position until it is replaced by permanent fencing or completion of the whole of the works unless the Engineer permits its earlier removal.

700.3 Maintenance

All fences shall be regularly inspected and maintained, any defects being made good immediately they are noticed by or brought to the attention of the Contractor. The Contractor shall be responsible for all wear and tear of fencing howsoever arising until the construction of all other works has been completed, when the permanent fencing shall be handed over in sound condition, and the temporary fencing shall be removed.

700.4 Temporary Fencing

Unless specified otherwise on drawings or directed otherwise by the Engineer,

Temporary fencing shall be post and wire fencing to BS 1722 Part 3 Type SW 48 using plain wire and round wooden posts, or an alternative approved by the Engineer which shall not be inferior. Where temporary fencing has to be removed temporarily for the execution of any part of the works it shall be reinstated as soon as possible and in the meantime the gap in the fencing shall be patrolled to ensure that no unauthorized crossing of the fence line occurs, and that no animal stock escape from adjoining lands.

701 CONCRETE POSTS FOR CHAIN LINK FENCING

701.1 Standard

In general all fencing is to be in accordance with BS 1722, Part I: 1963.

701.2 Reinforced Precast Concrete Posts

Concrete posts and struts shall be of Class 30 reinforced concrete, generally in accordance with Section 3 of the Specification. The course aggregate shall not exceed 10 m.

701.2.1 Straining Posts

These shall be 130 mm square in Section and 3.280 metres long overall with 600 mm top length cranked at an angle of 45 degrees to the vertical, slightly rounded at the external and internal cranked angles and also at the top end. The post is to be reinforced with 4 No. 8mm diameter mild steel bars bound by No. 12 SWG wire (2.64 mm diameter) stirrups placed at 150 mm intervals, and suitably holed for stretcher bolts or stirrup wires. The minimum concrete cover to the reinforcing bars shall be not less than 15 mm. The post will be notched twice to receive ends or raking struts. Two faces of the post will have two sets of galvanised mild steel angleiron cleats held by galvanised 25 mm x 4 mm GMS flatiron stretcher bar and GMS bolts and nuts.

The strainer posts shall be provided at all ends and corners, at changes in direction or acute variation in levels and at intervals not exceeding 70 metres in straight length of fence. The post shall be set in the ground to a depth of 0.75 m in a 450 mm square hole which is to be backfilled with Class 15 concrete.

701.2.2 Special Corner Posts

These shall be provided at all corners. The posts shall be 130 mm square, generally as straining posts, but the top cranked length and angle shall be altered to suit the corner angle to allow the barbed wire to run straight and level

The post shall be set in the ground to a depth of 0.75m in a 500 mm square hole which is to be backfilled with Class 15 concrete.

701.2.3 Struts or Stays

The raking struts shall be 100 mm square in section and 3.000 m long overall with one end splayed to suit the notch in the strainer post. The strut is to be reinforced with 4 No. 8mm dia. mild steel bars held by No.12 SWG wire stirrups placed at 130 mm intervals. The strut will be suitably holed for fixing by GMS bolts through the strainer post. The strut will be set in the ground in a hole 300 mm wide by 850 mm long by 750 mm with Class 15 concrete and the rest with good earth.

702 CHAIN LINK FENCE

702.1 The line shall be so erected that on completion it is truly on the boundary line of the plot. The top of the fence shall follow a general profile of the ground as agreed by the Engineer. The fence shall be embedded upto a depth of 80 mm under ground which will be graded to a general profile prior to the erection of the fencing.

702.2 Chain link fencing shall comply with BS 1722, Part 1, Clause 4 in general, and shall be of 50 mm galvanised mesh, not less than No. 10.5 SWG, and shall be Type LC 72.B.

702.3 Fittings for securing the fencing to the p.c.c. posts shall be in accordance with BS 1722, Part I, Clause 14 and shall be heavily galvanised.

702.4 Line wire shall be No. 9.5 SWG galvanised wire, and shall be attached and strained tightly to each straining post by means of winding brackets and to intermediate posts by a wire stirrup passed through a hole in the post. The top wire shall be secured 25 mm below the top and the bottom wire reasonably close to the ground. The intermediate wire shall be secured approximately midway between top and bottom wires.

702.5 Stirrup wire shall be No. 12.5 SWG galvanised wire

702.6 Tying wire for securing the chain link fencing to the line wire shall be galvanised No. 14.5 SWG.

702.7 Three rows of barbed wire shall be attached and strained to each straining post and secured with stirrup wire to holes in the cranked top of each intermediate post.

702.8 In general all chain link fencing shall be fixed according to BS 1722, Part I, Clause 22.

703 BARBED WIRE FENCING ON WOODEN POSTS

703.1 All timber used for fencing shall be well seasoned, straight grained red cedar.

703.2 Straining Posts shall be 2.60 m long and 150 mm in diameter. These shall be firmly embedded in ground and shall be provided at all ends, corners, and acute changes in direction or level, and shall be erected at intervals not exceeding 100 m in straight lengths of fences.

703.3 Struts shall be 100 mm in diameter and 3.0 m long secured to the straining post at an angle of 45° with a bird's mouth rebated joint spiked through with at least 2 No. 45 mm galvanised iron nails in previously drilled holes. The foot of the strut shall be sunk into the ground to a depth of 0.75 m and the roots shall bear against the undisturbed ground. There shall be one strut to each line of wires leaving the post.

703.4 Intermediate posts shall be 2.40 m long and of 100 mm diameter and either pointed at one end and driven into the ground to a depth of 0.60 m or sunk into the ground by excavating a hole and backfilling. These shall be provided at intervals of not exceeding 5 metres.

703.5 Droppers shall be 40 to 50 mm in diameter and 1.5 m long, threaded between wire strands at intervals not exceeding 5 m between strainer posts, except where intermediate posts occur.

703.6 The fence shall consist of six strands of wire spaced at 0.286 m intervals, the bottom strand being 0.30 m and the top 1.75 m from ground level or such other spacing as directed.

703.7 The top wire shall be No. 12 SWG two ply galvanised steel wire with four point barbs 150 mm apart. The lower 5 strands shall be either the same as the top wire, or plain No. 8 SWG galvanised wire, as set out in the Bill of Quantities. Binding wire, where used, shall be No. 12 SWG galvanised and the staples shall be 38 mm No. 8 SWG galvanised. The wire shall comply with BS 1052 and the galvanising to BS 443. The minimum breaking strength for plain No. 8 SWG steel wire shall be 1110 lb. and for two ply 12 SWG barbed wire 950 lbs.

703.8 Each wire shall be strained tight by means of at least one ratched winder or other approved strainer and the end made fast by two complete turns round the strainer post and by two staples driven tight. Each wire shall then be attached to the intermediate post and dropper

by a single staple or binding wire.

704 GATES

700.1 Gates shall be constructed to details shown on the drawings. All steelwork shall comply with the requirements of Section 9 of the Specifications.

SECTION 8 - DRAINAGE

INDEX

801	-	GENERAL.....	141
802	-	uPVC PIPES.....	141
803	-	CONCRETE PIPES AND FITTINGS.....	141
804	-	JOINTING CONCRETE PIPES.....	142
805	-	PIPES ON GRAVEL BEDDING.....	142
806	-	LAYING PIPES FOR SEWERAGE AND DRAINAGE.....	142
807	-	CONSTRUCTION OF CHAMBERS AND MANHOLES.....	142
808	-	INSPECTION COVERS AND MANHOLE COVERS.....	143
809	-	TESTING DRAINS, MANHOLES, ETC.....	143
810	-	RAINWATER PIPES AND GUTTERS.....	144

SECTION 8

DRAINAGE

801 GENERAL

801.1 All drainage works shall comply with the Building Code of the Republic of Kenya, and any local by-laws.

801.2 The Contractor shall bring to the Engineer's attention in writing any part of the Works which he considers does not conform to such code or bylaws. If the Engineer considers that such part of the Works does not so conform he will issue an instruction.

802 uPVC PIPES

802.1 Unplasticised polyvinyl chloride (uPVC) pipes and fittings for sewerage and drainage shall comply generally with BS 3506, Class “B” and shall be obtained from an approved manufacturer. Joints shall comply with BS 4346 - Part 1.

803 CONCRETE PIPES AND FITTINGS

803.1 Concrete pipes and fittings shall comply generally with BS 5911: Part 1 and shall be obtained from an approved manufacturer. The pipes and fittings shall have a smooth internal surface and the internal dimensions shall be true and regular and shall permit an even invert to be laid.

803.2 Before any length of pipe is laid all pipes shall be stood or slung vertically along the sides of the trench and be ‘rung’ with a wooden mallet. Any damaged or cracked pipe shall be rejected.

803.3 The bedding to and class of concrete pipes shall be suitable for the total external loads to be imposed on them, having consideration to the depth of cover, soil type, trench width and location. The Contractor shall determine the bedding type and class, full calculations shall be submitted to the Engineer for approval before the pipes are laid.

803.4 Joints be of either rubber ring or spun hempen tarred yarn type.

804 JOINTING CONCRETE PIPES

804.1 Immediately before each pipe having a spigot and socket joint is laid a gasket of 12 mm spun hempen tarred yarn shall be looped around the spigot end which shall then be firmly pushed home into the socket of the preceding pipe. The yarn shall be cut to such a length as to form a butt joint at the top of the pipe. The yarn shall be caulked into the joint with a caulking tool particular care being taken to ensure that the spigot end is held truly central in the socket. A jointing mixture of cement mortar as specified shall then be forced into the joint with the fingers. The compound shall be finished square with the end of the socket with a trowel. No joint shall be cemented until the gaskets of the next three joints in advance have been completed.

804.2 In the case of concrete pipes with ogee joints the joints shall be buttered with cement mortar before pressing the pipes together and than flush pointed internally and externally.

804.3 Any jointing material which gets inside the pipes when a joint is being made shall be removed by a “badger” which must be kept in the pipes during the time they are being laid. The badger shall be pulled forward and the surplus jointing material removed immediately after the laying of each pipe and before the next one is placed in position so that the barrel of the pipe is left perfectly smooth and clean.

804.4 Joints shall be cured by covering with sacking which shall be kept moist until the joints have completely set.

805 PIPES ON GRAVEL BEDDING

805.1 Unless otherwise dictated by the requirements of sub-clause 804.3, all concrete and uPVC pipes for drainage sewerage and ducts shall be laid on a 100 mm thick gravel bedding brought up to at least the horizontal diameter of the pipe. The bedding material shall consist of crushed stone or gravel passing an 11.2 mm sieve but retained on a 4 mm sieve mixed with coarse sand in the proportions of 2 parts of stone or gravel to 1 part sand.

805.2 Coarse graded gravel all-in ballast or screened selected excavated material may be used for the gravel bedding if it is of similar grading to that specified above and to the approval of the Engineer.

806 LAYING PIPES FOR SEWERAGE AND DRAINAGE

806.1 Pipes shall be laid true to line stretched along the side of the pipes and true to level by means of a straight edge 4 m in length kept inside the pipes and pulled forward to pegs boned in at suitable intervals between sight rails set to the proper levels. All pipes shall be cleaned out as the work proceeds.

807 CONSTRUCTION OF CHAMBERS AND MANHOLES

807.1 Chambers and manholes shall be constructed as shown on the detailed Drawings in the locations shown on the drawings or as directed by the Engineer.

807.2 Step irons shall be built into the walls as the work proceeds. Step irons shall be of galvanised malleable iron, complying in all particulars to BS 1247 and set at 300 mm centres vertically and 300 mm apart horizontally centre to centre.

807.3 Invert channels to chambers and manholes for sewers and drains (where used) shall be laid in precast concrete channels to the fall of the pipeline and jointed in cement mortar. All branch drains shall be connected to the main drain channel with half-channel bends of a proper angle and radius to lead with the run of the main drain channel, the bends being as "slow" as possible. The invert of the branch drain shall where possible be at least 80 mm above the invert of the main drain. Where it is found impossible to give a satisfactory lead with a precast concrete channel, the Engineer's Representative may direct the invert channel to be formed in concrete and rendered.

807.4 Manholes and chambers constructed of blockwork shall be rendered internally with 1:3 cement sand mortar. Manholes and chambers constructed of blockwork and protruding above ground level shall be rendered externally with 1:3 cement sand mortar to a depth of 200 mm below finished ground level. Manholes and chambers constructed of concrete cast in-situ shall be finished with fair faces and shall not be rendered.

808 INSPECTION COVERS AND MANHOLE COVERS

808.1 Manholes and chambers shall be fitted with covers and frames as indicated on the Drawings.

808.2 Heavy duty covers shall be fitted to manholes and chambers in roadways and in verges adjacent to roadway. Heavy duty covers shall be suitable for a wheel load of not less than 11 tonnes and shall be of the three point suspension non-rocking type.

808.3 Except where otherwise specified on the Drawings, medium heavy duty covers shall be fitted to manholes and chambers not subject to traffic loading. Medium duty covers shall be suitable for a uniformly distributed loading of not less than 70 kN/m² and shall be of the recessed steel type suitable for in-situ filling with concrete.

808.4 Covers fitted to manholes and chambers on sewers and drains shall be of the sealed type. The Contractor shall submit to the Engineer's Representative for approval full details of all inspection and manhole covers to be supplied.

808.5 All manhole and inspection covers shall be set in cement mortar or built into concrete slabs as shown or directed to the correct levels, cambers or falls.

809 TESTING DRAINS, MANHOLES ETC.

809.1 All drains and manholes shall be watertight and clean throughout and shall be tested by the Contractor under a minimum head of 1 m in the presence of the Engineer's Representative during the progress of the work at the completion of same and if so instructed immediately prior to the payment of the retention money or at any time as the Engineer may direct.

809.2 No pipelines or other work shall be covered up until they have been seen and approved by the Engineer's Representative.

809.3 Should the pressure fall during test the Contractor shall locate the leaks and make them good after which the pressure shall be re-applied and the process repeated until the drains are satisfactory.

809.4 In every case the water used for testing the pipes shall be left in the pipes until they are covered with earth or other filling to the top of the trench or depth of at least 1.2 m over the top of the pipes and until permission is given by the Engineer's Representative for the water to be released. If after the Engineer's Representative has approved the pipes and has given permission for the trenches to be refilled the pipes become damaged and lose water from any cause and/or admit subsoil water the pipe shall be uncovered and the defect made good and the pipe retested as before to the satisfaction of the Engineer's Representative.

810 RAINWATER PIPES AND GUTTERS

810.1 Asbestos-cement rainwater down pipes, fittings and gutters shall comply with BS 569.

810.2 PVC rainwater down pipes, fittings and gutters shall comply with BS 457.

810.3 Cast iron rainwater down pipes shall be of medium grade and comply with BS 460.

PREAMBLE AND NOTES TO BILLS OF QUANTITIES

1. These Bills of Quantities form part of the Contract Documents and are to be read in conjunction with the Conditions of Contract, Standard and Special Specifications and Drawings. The Particular Specifications overrides any Clauses / General Specifications given in the Preamble.
2. Whenever reference is made to "The Engineer" or "The Engineer's Representative" in the Bills of Quantities, it shall be construed to mean the person appointed by the Employer to act as the Project Manager or Engineer for the purposes of the Contract and named in the Contract Data, or other person appointed from time to time by the Employer and notified to the Contractor.
3. The quantities set forth in the Bills of Quantities represent the character of the work to be carried out. There is no guarantee to the Contractor that he will be required to carry out the quantities of work indicated under any one particular item or group of items in the Bills of Quantities. Though on the Contract as a whole, the quantities are intended to represent the overall value of the work to be carried out.
4. The prices and rates inserted in the Bills of Quantities will be used for valuing the work executed and the Engineer will measure the whole of the works executed in accordance with the Contract.
5. The prices and rates inserted in the Bills of Quantities are to be the full inclusive costs of the works described under the items, complete in place and in accordance with the Specifications and Drawings, including setting out of the works, including costs and expenses which may be required in and for the construction of the works described, together with any temporary works and installations which may be necessary and all general risks, liabilities and obligations set forth or implied in the Documents on which the Contract is based.
6. The brief description of the items given in the Bills of Quantities are purely for the purpose of identification and in no way modify or supersede the detailed descriptions given in the Conditions of Contract, Specifications or Drawings. When pricing items, reference is to be made to the Conditions of Contract, Standard Specifications, Drawings and Special Specification for the full directions and description of work and materials.
7. A price or rate is to be inserted, in ink, against each item in the Bills of Quantities, whether quantities are stated or not, and if the Bidder includes the cost of a particular item elsewhere in his rates or prices, he shall insert the word "nil" against both the rate and extension of that particular item. Should the Bidder omit to price an item, then it will be assumed that he has included the cost of the item elsewhere in his rates or prices.
8. No alteration shall be made to the Bills of Quantities and no extra item shall be inserted. The Bidder shall satisfy himself that the Contract Sum arrived at by pricing the quantities and items given is sufficient compensation for constructing and maintaining the whole of the works in accordance with the Contract Documents.
9. For the purpose of payment by Interim Certificate of "Lump Sum" items the Engineer may assess the portion of the work completed on the "Lump Sum" item and allow for payment of the portion of the "Lump Sum" he deems fair and reasonable. The total of all portions allowed shall not exceed the "Lump Sum". All interim payments shall be subject to the retention stipulated in the Contract Documents.
10. During construction, the unit rate established for an item in one Bill of Quantities may be used as a basis for establishing a unit rate for similar work in another Bill of Quantities which contains no such item. No additional cost will be considered for such an eventuality.
11. The Contractor will be provided by the Employer with all that land occupied by the Permanent Works including the specified working width for pipe laying and other permanent construction works. The

costs of compensation and entry upon land (if any) for the specified working width will be paid by the Employer. All other costs for temporary access to the works or additional working space shall be borne by the Contractor.

12. All costs related to strict adherence to all Health and Safety regulations stipulated in the National Legislation of Kenya as well acceptable international good practices for both temporary and permanent works pertaining to nature of the works under this Contract, shall be deemed included in the Contractor's rates.
13. It shall be the responsibility of the Contractor to arrange for the removal of, or alteration to existing services where necessitated by the Works. Costs incurred will be paid under relevant items in the Bills of Quantities.
14. Quantities for site clearance, stripping and spreading shall be based on plan area cleared or stripped.
15. The rates for excavation items shall be deemed to include inter alia for setting aside spoil for reuse in the Works or disposing to approved tips identified by the Contractor in liaison with the Local Authority and approved by the Engineer, except where otherwise provided for in the Bills of Quantities.
16. Generally, excavation items are based on volumes for structures and on linear measurements for certain pipelines. The work may be covered by one or more items. The rates shall include as appropriate for: -
 - a) Breaking through surfaces, handling different classes of material separately; excavation beyond the net plan area of the foundations, for safe working space and for battering or timbering etc.
 - b) Timbering
 - c) Dealing with water from any source whatsoever
 - d) Backfilling as specified
 - e) Disposal of surplus spoil

Measurement of volume of excavation for structures shall be calculated from the plan dimensions of the structure without allowance for working space.

The depth of excavation in pipe trenches will be measured from stripped ground level to the invert of the pipe. Measurement for other excavations will be to the size which is required to accommodate the permanent works. A Bidder shall accordingly allow in his prices for any amount of extra excavation, which may be necessary for safe working space to complete the work to the satisfaction of the Engineer.

Items are included for "Extra Over for Rock" on a volume basis and within the specified trench dimensions. The rates shall include for breaking out, mucking and disposal by method(s) approved by the Engineer and any other additional costs for other works or special methods adopted for excavation and disposal by the Contractor, encountered within measured excavation.

Different rock classifications are defined in the Specifications and have been billed separately. Rock shall be measured as a volume calculated from the thickness encountered within the plan area of a mass excavation, within the plan dimensions of a structure, or within the nominal width of a trench. The decision of the Engineer on the classification of rock encountered in excavation shall be final and binding. Note: Any excavation of murrum in whatever form will be taken as common excavation.

Timbering left in excavations shall only be measured for payment where it is specified or ordered by the Engineer.

17. Excavation by mechanical equipment may not be possible in some area due to restricted wayleaves, slopes/topographical features, ground water from whatsoever source, existing structures, drains, roads, trees, fences, walls, etc. The Contractor's rates for pipe trench excavation shall be deemed to cover mechanical and/or manual excavation. No claim for restricted space or double haulage will be entertained.

The Contractor shall indemnify the Employer against all claims for damage which in opinion of the Engineer may be caused by Excavation. This includes reinstatement of road surfaces, drains, fences, wall, culverts, etc., all in accordance to relevant authority.

18. When the site of any particular item of the Works has been sufficiently cleared of trees, undergrowth etc. and before any excavation or filling has been carried out, the Contractor shall carry out a survey under the Supervision of the Engineer's Representative to take, record and agree upon an adequate number of original ground levels. The data so obtained shall be used as a basis for the computation of excavation and filling and preparation of "As-Built" Drawings by the Contractor. If for whatever reason the Contractor commences excavation without taking levels, the Engineer's decision on the original ground levels to be used for computation will be final.
19. The volume of fill will be measured net to the finished levels as shown on drawings or as amended by the Engineer.

20. METHOD RELATED CHARGES

- a) In order that the Contractor may cover his cost in executing specific portions of work, where those costs are not properly attributable to the quality of permanent works to be executed, he may cover such costs in the Bills of Quantities in accordance with the following provisions.
- b) For the purpose of these charges the following words and expressions shall have the meaning hereby assigned to them.
- i. 'Method Related Charge' means the sum for an item inserted in the Bills of Quantities by a Bidder in accordance with paragraph 20 c).
 - ii. 'Time Related Charge' means a Method Related Charge for work the cost of which is to be considered as proportional to the length of time taken to execute the work.
 - iii. 'Fixed Charge' means a Method Related Charge which is not a Time Related Charge.
- c) A Bidder may insert in the Bills of Quantities, in the Bill provided, 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 costs of which are not to be considered as proportional to the quantities, rates and prices for the other items.
- d) Each item for a Method Related Charge inserted by the Bidder shall be fully described so as to define precisely the extent of work covered and to identify the constructional resources (plant, equipment, etc.) to be used and particular items of permanent or temporary works to which the items relate. The description shall include the type of charge (Time Related or Fixed) and in the case of a Time Related Charge, shall include also the expected duration, and the rate of charge.
- e) The insertion by a Bidder of an item for a Method Related Charge in the Bills of Quantities shall not bind him to adopt the method stated in the description of the item. However, in the case of a Time Related Charge, where the method is changed, a revised rate of charge

shall be used taking account of the revised execution period to give the same total charge, had the original method, time and charge rate been adhered to.

If the charge is a Fixed Charge, then payment to the Contractor for such an item shall be in equal installments spread evenly throughout the duration of that part of the works which is the subject of the Fixed Charge.

- f) Method Related Charges shall not be admeasured but shall be deemed to be prices for the purpose of Clauses 36 of the Conditions of Contract and shall be paid in accordance with Clause 40.4 of the Conditions of Contract.
- g) In the event of the satisfactory execution of any part of the works which has been the subject of an item for a Method Related Charge using, whether in whole or in part, a method other than that described in the item, the Contractor shall nevertheless be entitled to payment of the Method Related Charge or the balance thereof, as the case may be, such instalments at such times and upon such events as may from time to time be agreed between the Engineer and the Contractor. In default of such agreement the Method Related Charge, or the balance then unpaid, shall be allowed to the Contractor by way of instalments in interim certificates at such times and upon such events as the Engineer shall decide.

The amount of Method Related Charge shall be neither increased nor decreased by reason of any change in method made by the Contractor, unless such change has been ordered by the Engineer, in which case the provisions of Clause 38 of the Conditions of Contract shall apply.

- 21. The rates for concrete shall include for fresh and hardened concrete tests prescribed in the Specifications including making and testing concrete cubes and forwarding the results to the Engineer. Testing to be carried out by a Test Laboratory approved by the Engineer. The Contactor shall maintain a written log of cubes prepared indicating date of testing and results achieved. The Contractor shall designate a qualified person for preparation and follow-up on cube tests in coordination with the Engineer / Engineer's Representative.
- 22. The rates for precast concrete paving shall include for all cutting, bedding, jointing and laying to falls.
- 23. The rates for precast concrete edging and kerbs shall include for formwork, concrete bed and backing, all cutting, jointing and laying.
- 24. All formwork must be cleaned and oiled prior to use. All exposed concrete edges shall have a 20 mm chamfer unless otherwise directed and costs deemed to be included in formwork rates. The formwork rates shall also be inclusive of all necessary box outs and cut outs for individual holes up to 1 square metre.

The rates for forming rebates in concrete walls etc. shall include for forming pockets for the fish tail fixing cleats where required.

Deductions from formwork quantities will be made for openings more than 1 square metre in area.

- 25. Formwork for upper surfaces inclined at 30 degrees or less to the horizontal is not measured and the cost of any such formwork used will be deemed to be included in the relevant concrete item rate.
- 26. Wrought formwork where specified will be measured to 150 mm below final ground levels.
- 27. Items required for Structural Joints and Construction Joints shown on drawings shall be paid for as per the rates in the Bills of Quantities; the rate for providing and fixing PVC water bar is deemed to be inclusive of all joints, overlaps, junctions, welding, etc. formwork not shown on drawings shall

be deemed to be included in the unit rates for concrete work.

28. All rates and sums in the Bills of Quantities shall be in Kenya Shillings and Cents.
29. If possible, a construction wayleave of up to 9m for the Transmission Mains and construction wayleave of up to 3m for Distribution Mains will generally be allowed. In the event the above-mentioned wayleave widths are not available due to obstructions or restricted access, the Contractor will execute the works using suitable approved alternative methods. The costs for alternative methods are deemed to be covered by bid rates. No additional costs will be allowed.

Payment for site clearance will be based upon this width except that the Engineer reserves the right to restrict this width due to the presence of obstructions, roads, houses, footpaths, boundary walls, fences, trees and the like. Payment shall then be according to the actual area cleared. In case additional space is required this may be made available by the Contractor at his own cost.

No claim for additional space will be entertained by the Engineer. No claims for inconvenience and the like caused by obstruction will be entertained. The rates shall be deemed to include for reinstatement of fences, gates, etc.

30. All pipe diameters indicated in the Bills of Quantities and on Drawings are nominal. Fittings dimensions to suit size/type of pipes supplied by the Bidder and Bidder's rates are deemed to allow for this. No additional cost adjustment will be allowed.
31. Unless otherwise specified the method of measurement shall be in accordance with the Standard Method of Measurement of Civil Engineering Quantities (CESMM3) published by the Institution of Civil Engineers, London, 1991. In some cases variations to this method have been made to suit local practice. A Contractor shall be deemed to have priced the items accordingly and no claims relating to variation from the method of measurement stated in these documents shall be considered.
32. Items for buildings, electrical and mechanical works are not described using CESMM3 for clarity purposes.
33. All quantities have been measured in Metric Units.
34. Explanation of abbreviations used in the Bills of Quantities are as follows: -

L.S.	-	Lump Sum
P.S.	-	Provisional Sum
P.C.	-	Prime Cost
E.O.	-	Extra Over
Avg.	-	Average
Max.	-	Maximum
Min.	-	Minimum
n.e.	-	Not Exceeding
Nr	-	Number
mm	-	Millimetre
m	-	Linear Metre
m ²	-	Square Metre
m ³	-	Cubic Metre
Ha.	-	Hectare
Drg.	-	Drawing
Kg.	-	Kilogramme
H.T.	-	High Tensile
M.S.	-	Mild Steel
B.L.	-	Bitumen Lined
Dia.	-	Diameter
E.C.	-	Epoxy Coated

E.L.	-	Epoxy Lined
S & S	-	Socket & Spigot
C.L.	-	Cement-mortar Lined
C.I.	-	Cast Iron
D.I.	-	Ductile Iron
uPVC	-	Unplasticised Polyvinyl Chloride
G.I.	-	Galvanised Iron
G.M.S.	-	Galvanised Mild Steel
P.E.H.	-	Palothene
PE	-	Polyethylene
Hr.	-	Hour
FE/Fe	-	Ferrous

35. The rates for metalwork shall include for bolts, nuts, washers and rag-bolts, fixing as specified or in accordance with the manufacturer's instructions and rectifying as specified any parts of the painted, coated or galvanized surface that may be damaged either before or after erection.

36. The rates for fixing penstocks and flap valves etc. shall include for bedding and grouting, testing for water tightness, greasing all working parts and leaving in good working order; where the item includes supply, the rates shall also include for supplying drawings for approval before manufacture is commenced.

37. Concrete Works

a) Item : Concrete

Unit : m³ of each class

Concrete shall be measured by the cubic metre of each class calculated from the dimensions given on the drawings or as instructed by the Engineer.

No deduction shall be made in the measurement for:

- i) bolt holes, pockets, box outs and cast-in components provided that the volume of each is less than 0.15 cubic metres;
- ii) mortar beds, fillets, drip moulds, rebates, recesses, grooves, chamfers and the like of 100 mm total width or less;
- iii) reinforcement.

The rates for concrete shall include for the cost of:

- i) provision and transport of cement, aggregate and water;
- ii) admixtures and workability agents including submission of details unless otherwise specified;
- iii) batching, mixing, transporting, placing, compacting and curing;
- iv) class UF1 finish;
- v) laying to sloping surfaces not exceeding 15 degrees from the horizontal and laying to falls;
- vi) formwork to blinding concrete;
- vii) placing and compacting against excavated surfaces where required including any

additional concrete to fill overbreak or working space;

viii) complying with all the requirements of the Specifications.

b) Item : Blinding Concrete

Unit : m³

Blinding concrete shall be measured by the cubic metre calculated as the product of the plan area of the foundation as shown on the drawings and the instructed thickness. No deduction shall be made for openings provided that the area of each is less than 0.5 square metres. Blinding concrete over hard material shall be measured as the volume used provided that the maximum thickness of 150 mm allowed for overbreak is not exceeded.

The rate for blinding concrete shall include for all costs itemised in Note 37(a) of this Preamble.

c) Item : No Fines Concrete

Unit : m³

No fines concrete shall be measured by the cubic metre calculated from the dimensions given on the drawings or as instructed by the Engineer.

The rate for no fines concrete shall include for all costs stated in Note 37(a) of this Preamble.

d) Item : Unformed Surface Finishes

Unit : m² of each class of finish

Unformed surface finishes shall be measured by the square metre from the dimensions given on the drawings or as instructed by the Engineer.

The rate for concrete in Notes 35(a), (b) and (c) shall include for class UF1 finish.

The rate for unformed surface finishes shall include for the cost of complying with Clause 410 of the Specification.

e) Item : Formwork for Formed Surface Finishes

Unit : m² of formwork for each class of finish for each range of inclinations

Except as stated below, formwork shall be measured by the square metre of formwork actually in contact with the finished face of the concrete. No deduction shall be made in the measurement for openings, pipes, ducts and the like, provided that the area of each is less than 0.50 square metres. Unless otherwise stated, if the volume or area of concrete has not been deducted when measuring the concrete in accordance with Notes 37(a), (b) and (c), formwork to form or box out the void shall not be measured.

Formwork less than 300 mm high to edges of slabs shall be measured by the linear metre in accordance with Note 37(f) of this Preamble.

Inclined formwork shall be measured in accordance with the following classifications:

i) Horizontal: 85 to 90 degrees inclination from vertical

ii) Sloping: 10 to 85 degrees inclination from vertical

- iii) Battered: 0 to 10 degrees inclination from vertical
- iv) Vertical: 0 degrees
- v) Sloping upper surfaces inclined at more than 15 degrees from the horizontal

Formwork required for blinding concrete, to form construction joints and shear keys for future concrete and other construction surfaces shall not be measured and the costs shall be included in the rates for other work.

Formwork to contraction and expansion joints shall be measured by the square metre on one face only. The rates shall include for the costs stated below and for forming recesses for sealant and channels for grout.

The rates for formwork shall include for the cost of submission of details, providing and transporting all materials for formwork and falsework, erection including provision of supports, fillets and chamfers 75 mm and less in width, bolts, ties, fixings, cutting to waste, drilling or notching the formwork for reinforcement where required, working around pipes, ducts, conduits and waterstops, temporary openings, cleaning, dressing, stripping, filling bolt holes and any remedial work and for complying with all the requirements of the Specifications.

- f) Item : Formwork to Edges of Slabs

Unit : m of each class of finish

Formwork less than 300mm high to edges of slabs shall be measured by the linear metre.

The rate shall include for the costs stated in Note 37 (e) of this Preamble.

- g) Item : Waterstops

Unit : m of each type

Waterstops shall be measured by the metre run of each type.

The rate for water stops shall include for the provision, installation, jointing, any sealants required at the face of the concrete and for placing and compacting concrete around the waterstop.

- h) Item : Mortar

Unit : m²

Mortar used for bedding base plates and the like shall be measured by square metre as the area of the base plate at the specified nominal thickness of bedding.

Mortar used in filling bolts pockets and the like shall not be measured separately and the costs shall be included in the rates for the bolts.

The rates for mortar shall include for the cost of providing and placing the mortar and of complying with all the requirements of the Specifications.

- i) Item : Admixture Workability and Hardening Agents

Unit : As specified in the Special Specification

Where required by the Special Specification admixtures, workability and hardening agents shall be measured and paid for in accordance with the Special Specification.

- j) Item : Reinforcement
Unit : Tonne of each type for each range of diameters

Reinforcement shall be measured separately for each of the following ranges:

- i) of diameter equal to or less than 16mm
ii) of diameter greater than 16mm

Steel fabric reinforcement shall be measured in accordance with Note 37(k) of this Preamble.

Steel (plain and deformed bars) reinforcement shall be measured by the tonne and shall be the calculated weight of the steel required including splice lengths shown on the drawings. No allowance shall be made in the measurement for rolling margins or cutting waste. The density of steel shall be taken as 7850 kilogrammes per cubic metre.

The rates for reinforcement shall include for cost of providing, cutting to length, splice lengths additional to those shown on the drawings, laps, bending, hooking, waste incurred by cutting, cleaning, spacer blocks, provision and fixing of chairs or other types of supports, welding, fixing the reinforcement in position including the provision of wire or other material for supporting and tying the reinforcement in place, being reinforcement aside temporarily and straightening, placing and compacting concrete around reinforcement and for complying with all the requirements of the Specifications.

- k) Item : Fabric Reinforcement
Unit : m² of each type

Steel fabric reinforcement shall be measured by the square metre and shall be the calculated area excluding any allowance for laps.

The rate for steel fabric reinforcement shall include for the costs stated in Note 37(j) of this Preamble.

Sewers, Drains and Pipelines

38. The rates for pipes, pipework and specials shall include for supply of all materials, setting of concrete blocks and hardwood wedges where specified, providing any temporary support that may be necessary, preparing ends of pipes for jointing and all labour in jointing, protection to detachable joints, cleaning pipelines and rectifying as specified any damage to surface coating. The rates shall also include for all cutting of pipes consequent upon structures, specials and fittings being constructed in the designated positions.
39. The rates for concrete surround, bed and haunching to pipes, concrete in anchor blocks to pipes, and to gully pots shall include for all formwork required and for any additional concrete the Contractor may place for his own convenience or by reason of the method of carrying out the work.
40. Pipes, Fittings and Valves – General Specifications are given in applicable International Standards referred to in the following SRNs:

- a) uPVC pipes and fittings to SRN 300 Class 'E' (16 bar), or as specified
- b) Steel pipes and fittings to SRN 210, SRN 212 and SRN 216
- c) Ductile Iron (DI) pipes and fittings to SRN 202
- d) Galvanized Iron (GI) pipes and fittings to SRN 203
- e) Flexible joint spigot and socket precast concrete (PVC) pipes to SRN 409
Rigid joint spigot and socket pcc pipes to SRN 409
Ogee joint PCC pipes to SRN 407
- f) All flanges to SRN 207, NP 16 or as specified
- g) Gate valves to SRN 501, NP 16 or as specified
- h) Double orifice air valves as specified
Single large orifice air valves as specified
Single small orifice air valves as specified
- i) Fire hydrants to SRN 509
- j) Butterfly valves to SRN 506, NP 16 as specified
- k) Ball float valves as specified
- l) All pipe, fittings and valve diameters indicated are nominal diameters
- m) Supply of pipes and fittings to include for cost of supply of all jointing materials like bolts, nuts, washers, gaskets, packings, jointing glue, etc.
- n) uPVC pipes to be supplied complete with compression joints
- o) Supply of C/L steel pipes to be with flange or push-in joints. If plain ended pipes are offered, one number coupling per length is to be included. Coupling is subject to approval by Project Manager
- p) Ductile Iron pipes to be with push-in type joints
- q) Galvanized Iron pipes to be with threaded coupling joints, or as specified
- r) Precast concrete ogee pipes to be complete with all jointing materials

Shop Drawings

41. Detailed shop drawings, in triplicate, to be provided for all items where ferrous pipework, fittings and any metalwork i.e. penstocks, ladders etc., are indicated to be installed as outlined in the bills of quantities and drawings. These drawings to be submitted well in advance of ordering of the above materials and the billed rates are deemed to include for provision of these drawings, samples where requested, and inspection where fabricated by the Engineer or his Representative.

Prime Cost Items

42. Attendance on nominated Sub-Contractors shall include for all or any of the following as appropriate - labour, materials and plant required for taking delivery, carting, storing, hoisting and

- builder's work entailed in fixing, erecting and installing as specified or in accordance with the manufacturer's instructions and all overheads and profits.
43. When, in the opinion of the Engineer, it is reasonable to expect the Contractor to price the attendance item it will be so included in the Bills of Quantities. In all other cases it will form the subject of a Provisional Sum to be expended on a Dayworks basis.
 44. Profit shall include for establishment charges, profit and any other costs not included in the attendance item.
 45. The rates for the supply of any mechanical and electrical equipment shall include for the submission of factory test results.
 46. Definitions of Terms used in Bill of Quantities
 - a) **'Provide'** - shall mean all costs to cover purchase of materials in good condition, services for transaction with the supplier, supervision, transport to site of works all charges for rental, consumptions, overheads and profits throughout the Contract. It shall also include for all maintenance, insurance and handling and storage whenever applicable.
 - b) **'Excavate for'** - shall mean handling of any material from its incumbent position intended for specified work shown in the drawings or directed by the Project Manager and backfilling and compacting part of material after laying of pipes or erection of structures, and cart away remaining to tips to be provided by the Contractor. The cost for this work shall include all survey, supervision, labour, tools, machinery, protection of work, pumping, insurances and overheads and profits.
 - c) **'Laying'** - shall cover all work necessary for placing an object or material to true line and level specified in a drawing or as directed by the Engineer.
 - d) **'Jointing'** - shall mean process of fixing specified material, pipes, fittings and specials together using appropriate tools, material, labour and machinery. It should cover for all work necessary to provide matching of opposite parts in size, shape and position indicated and clamps, seatings and holders to hold firmly.
 - e) **'Testing'** - shall mean provision of all materials, apparatus, labour, machinery, charges for the media or chemical to be used and their transport, repair of object to be tested if required, re-testing, excavation of any part for visual inspection, erection of any type all until the object has been certified as having passed the required test satisfactorily.
 - f) **'Install'** - shall include for all work requirements stipulated for "laying" and "jointing". It will cover all expenses for the provision of labour, materials, removal from stores, complete erection, installation, supervision, site testing and commissioning as per the Specifications.
 47. The unit rates for the various items listed in the BOQ shall include, except insofar as it is otherwise provided under the Contract, all labour, construction equipment, materials, erection, maintenance, supervision, insurances etc. set forth or implied in the Contract. These are all deemed to include all allowances for waste or surplus of any kind, which are not subject to measurement.
 48. The rates to be indicated in the Bills of Quantities shall be inclusive of all applicable Government duties and taxes except Value Added Tax (VAT). The VAT amount shall be added to the Overall Bills Total in the Grand Summary. The Grand Total from the Grand Summary (inclusive of VAT) shall be carried to the Letter of Bid.
 49. The Employer's portion (50%) of DAAB's fees and expenses shall be covered by the contingencies.



Bills of Quantities

Bilatulamin Water Supply Project					
BOQ NO. 1-PRELIMINARY AND GENERAL ITEMS					
Item	Description	Unit	Quantity	Rate (Kshs)	Amount (Kshs)
A	GENERAL ITEMS				
A1	PRELIMINARY REQUIREMENTS (CONTRACTUAL)				
A111	Advance Payment Security	Sum	1		
A121	Performance Security	Sum	1		
A131	Insurance of Works	Sum	1		
A141	Insurance of Workmen	Sum	1		
A178	Allow for contractors overheads and profit	%			
A171	Establishment and maintenance Of Contractors Camp, incl. Training Levy. (not to exceed 0.5% of total bid price)	Sum			
A2	GENERAL REQUIREMENTS				
A21	Facilities for the Engineer's Staff				
A22	Accommodation allowances for the Engineer's Staff				
A223.4	Accommodation allowances for the Resident Engineer	Months	8	150,000	1,200,000
A23	Services for the Engineer's Staff				
	<u>Water and Electricity</u>				
A234.1	Provide Water and Electricity	Sum	1	30,000	30,000
	<u>Signboards</u>				
A235.1	Provide and maintain a project Sign Board	No.	2		
TOTAL PAGE 1 CARRIED FORWARD TO BILL COLLECTION SHEET					

BOQ NO. 1-PRELIMINARY AND GENERAL ITEMS					
Item	Description	Unit	Quantity	Rate (Kshs)	Amount (Kshs)
A24	Equipment for use by the Engineer's staff				
A243	Hire of Survey Equipment to specifications	Months	6		
A25	Attendance upon the Engineer's staff				
A251.1	Driver Provide (1 No.)	Months	8	35,000	280,000
A252.1	Chainmen Provide (1 No.)	Months	8	20,000	160,000
A254.1	4 No Interns	Months	8	100,000	800,000
A256.1	Watchmen Provide (2 No.)	Months	8	30,000	240,000
A26	Testing				
A262.2	Allow for factory visit of materials as may be ordered by RE	Sum	1		
A269	Allow for contractor profits and overheads to items A243 to A262.2	%			
A27	Testing of Works				
A271	Water Retaining Structures constructed in the project Including cleansing and sterilisation,	Sum	1		
A28	Temporary Works				
A282	Traffic regulation	Sum	1		
A287	De-watering	Sum	1		
A289	Relocation of existing services incl. tel., electricity, sewer, etc where anticipated (PROVISIONAL)	No.	1		
	TOTAL PAGE 2 CARRIED FORWARD TO BILL COLLECTION SHEET				

Item	Description	Unit	Quantity	Rate (Kshs)	Amount (Kshs)
A4	PROVISIONAL SUMS				
A190.1	Allow provisional sum for EIA expenses	sum	1	250,000	250,000
A190.2	Setting out the Works as specified or directed by the Engineer	sum	1	200,000	200,000
A532	Provide telephone services to the Engineer	Months	8		
A533	Supply and Delivery of 4WD SUV with 2,400 CC Diesel Engine, dual 6 speed manual transmission, air bags in the front and AC, security car alarm and bull bar kit for use by the Resident engineer. To revert to Employer upon project completion	LS			7,000,000
A535	Allow for Maintenance of REs Vehicle	Months	8	80,000	640,000
A536	Allow for Employers office Expenses	LS			2,000,000
A537	Allow for Gender mainstreaming, Road Safety training in the project towns in compliance with Performance Contract obligations	Sum	1	1	300,000
A538	Allow for Tree Planting and restoration activities in compliance with Performance Contracts and Presidential Directives	No	2000	250	500,000
A54	Percentage adjustment to Items A190.1 to A538	%			
	TOTAL PAGE 3 CARRIED FORWARD TO BILL COLLECTION SHEET				

BOQ NO. 1-PRELIMINARY AND GENERAL ITEMS					
COLLECTION PAGE					
Page No.					Amount (Kshs)
1					
2					
3					
	TOTAL CARRIED TO GRAND SUMMARY				

BILL NO 2: BILATULAMIN BOREHOLE DRILLING, EQUIPPING AND FENCING					
Item	Description	Unit	QTY	Unit Rate (Kshs)	Amount (KSHS)
	Drilling				
A345.1	Mobilisation of drilling unit to site, erect at position of borehole, dismantle and demobilise on completion	LS	1		
A345.2	Mobilisation of test pumping equipment, erect, dismantle and demobilize on completion	LS	1		
A345.3	Provide all other plant, equipment, stores, personnel materials and remove from site on completion	LS	1		
A345.4	Allow for all costs involved in providing water for all requirements	LS	1		
A345.5	Allow for clearance of site on completion	LS	1		
A345.6	Application, follow-up and acquisition of drilling permit from Water Apportionment Board	LS	1		
B332	Drilling 0 - 10 m	m	10		
B333	Drilling 10 - 20 m	m	10		
B334	Drilling 20 - 30 m	m	10		
B335	Drilling 30 - 40 m	m	10		
B336	Drilling 40 - 250 m	m	210		
I411	Supply and install 205 mm plain steel casing class B	m	3		
I511.1	Supply and install 205 mm plain UPVC casing class D	m	200		
I511.2	Supply and install 205 mm slotted UPVC casing class D	m	50		
J4162.1	Supply and install gravel pack with average grain size of 2 mm	ton	10		
L771.1	Grouting of top 3 metres of annular space between casing and borehole	LS	1		
L771.2	Form concrete surface plug around casing with dimensions 1000 x 1000 x 1000 mm	LS	1		
A345.7	Well development using air or water jetting as recommended by Hydrogeologist	Hr	6		
A345.8	Insertion and removal of equipment	Hr	6		
A345.9	Test pumping	Hr	24		
A345.10	Recovery Test	Hr	8		
A345.11	Supply and install 152 mm diameter well cap	LS	1		
	TOTAL PAGE 1 CARRIED FORWARD TO BILL COLLECTION SHEET				

Item	Description	Unit	QTY	Unit Rate (Kshs)	Amount (KSHS)
A345.12	Chemical analysis of water	LS	1		
A345.13	Supply and install gravel pack with average grain size of 2 mm	ton	10		
A345.14	Grouting of top 3 metres of annular space between casing and borehole	LS	13,000		
A345.15	Form concrete surface plug around casing with dimensions 1000 x 1000 x 1000 mm	LS	1		
A345.16	Well development using air or water jetting as recommended by Hydrogeologist	Hr	6		
A345.17	Insertion and removal of equipment	Hr	6		
A345.18	Test pumping	Hr	24		
A345.19	Recovery Test	Hr	8		
A345.20	Supply and install 205mm diameter well cap	LS	1		
A345.21	Chemical analysis of water	LS	1		
A345.3	Supervision of drilling works by Geologist	LS	1		200,000
	TOTAL PAGE 2 CARRIED FORWARD TO BILL COLLECTION SHEET				

BOREHOLE EQUIPPING					
Item	Description	Unit	QTY	Unit Rate (Kshs)	Amount (KSHS)
	Equipping				
	Erection of Gantry				
M72	Fabrication and erection of borehole gantry using 6" GI Pipes	no	1		
	Borehole Equipping				
	Allow for Supply and Installation of the following. The cost should include all the required fittings and Testing				
	Pump				
A345.17	A submersible pump with metallic impellers complete with a 11.0KW three Phase Motor with capacity to pump 2.77 litres/sec.against a head of 180M	No	1		
A345.18	Allow for a 11.0KW star Delta starter complete with the required fittings	No	1		
k561	GENSET/SOLAR UNIT				
k561.1	A generating set 3 phase or similar complete with suitable engine, alternator, base plate, exhaust system and control panel, with both handle and electric stating. The characteristics of the generator are as follows: Rating of Generator 31KVA with running speed of 1500-2000RPM	nr	1		
k561.1	Pump inverter & accessories-11.0kw	Ls	Item		
k561.2	Solar components	Ls	Item		
k561.3	Other Accessories	Ls	Item		
	Drawdown Pipes				
I16	65mm diameter GI Pipes Class D. Include all the required fittings	M	200		
K512.1	6mm ² x 4core submersible drop cable	m	300		
K512.2	Electrode cable (1mm ² x 1core)	m	300		
K512.3	Electrodes	no.	2		
K512.4	Cable splicing Kit	no.	1		
IJ52911.1	uPVC dipper pipes 1"	no.	3		
IJ52911.2	Starter pipe 65mm	no.	1		
IJ52911.3	Bottom adaptors 65mm	no.	1		
IJ52911.4	Top adaptors 65mm	no.	1		
IJ52911.5	Pump guard set 65mm	no.	1		
	TOTAL PAGE 3 CARRIED FORWARD TO BILL COLLECTION SHEET				

Item	Description	Unit	QTY	Unit Rate (Kshs)	Amount (KSHS)
	Borehole Surface Sundries				
K9411	Borehole cover plate 2" complete with fittings	no.	1		
J52911.1	GI Plug 65mm diameter	no.	1		
J52911.2	GI Hexagonal nipples 65mm	no.	6		
J52911.3	GI bend 65mm diameter	no.	5		
J52911.4	GI union 65mm diameter	no.	10		
J52911.5	GI Tee 65mm diameter	no.	10		
J52911.6	Gate valve 65mm diameter pegerlar	no.	4		
J52911.7	GI reducer tee diameter 65mm	no.	2		
i961	Pressure gauge 200bar	no.	2		
i956	Single orifice air valve	no.	3		
i941	Non Return Valve 65mm Peglar flap type	no.	2		
A345.19	Installation charges for borehole surface sundries	Lump Sum	Item		
	Electrical Sundries within a radius of 10m from borehole:				
M481	Junction Box complete fittings	no.	2		
K551	Cable trunking	no.	10		
K541.1	10mm ² x 4core armoured cable	m	20		
K541.2	1.5mm ² x 2core armoured cable	m	20		
K541.3	Float Switch	no.	2		
K541.4	Earth rod 1.2m c/w earth lead cables	set	1		
K541.5	Automatic Voltage Switch three phase (AVS)	m	1		
K541.6	Main switch fuse	no.	1		
K541.7	3.6Hp standard control panel board with lockable box	no.	1		
K541.8	Water meter complete with accessories 65mm	no.	1		
K541.9	Electrical and related works	no.	1		
K541.10	Installation of the pump	no.	1		
K541.11	Transportation to and from site	Km	1,600		
x611	Fencing				
x611.1	Precast concrete posts 2.5-3.0m high	m	132		
x611.2	Chainlink 2.5-3.0 m high anchored on the ground	Rolls	8		
x611.3	Barbed wire heavy gauge	Rolls	24		
x611.4	Double wide gate 4m wide & accessories	No	1		
	TOTAL PAGE 4 CARRIED FORWARD TO BILL COLLECTION SHEET				

5 by 7 Generator House					
-	-	-	-	-	-
ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS).
	GENERATOR HOUSE				
E	EXCAVATION				
E311.2	Strip topsoil to a maximum of 250 mm depth	m ³	22		
E334.1	Excavate for the slab in depth 0 - 1.5 m	m ³	8		
E334.2	Excavate trench for foundation in depths of 0-1.5m				
E612.4	Compaction for final surface under slab	m ²	63		
	HARDCORE				
E642.6	200 mm thick hardcore below floor slab	m ³	20		
F711	50 mm thick murrum blinding or similar	m ³	3.5		
W136	Provide and place 500 gauge polythene sheet damp proof membrane on top of quarry dust	m ²	63		
F	CONCRETE				
F711	50 mm concrete Grade 15 for blinding	m ²	63		
F243.1	Concrete grade 25 to strip footing	m ³	7		
F243.2	Ditto to ground floor slab	m ³	11		
F243.3	Ditto to 4 No plinth slabs	m ³	3		
F243.4	Ditto to ring beams	m ³	4		
G812	Provide 20 mm screed, cement and sand (1:2) to smooth finish to floor slabs	m ²	65		
G	FORMWORK				
G455.1	Sawn formwork to sides of the foundation	m ²	100		
G455.2	Ditto to sides of walls, and entrance slab	m ²	15		
G455.3	Ditto to beams	m ²	35		
	REINFORCEMENT BARS				
	High Tensile to BS4449				
G524	12 mm diameter	kg	180		
G522	8 mm diameter	kg	100		
G527	A 142 mesh	m ²	80		
	TOTAL PAGE 5 CARRIED FORWARD TO BILL COLLECTION SHEET				

ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS).
U	BLOCK WORK				
U521	200 mm concrete block-workk walling with cement mortar (1:3)	M	42		
W136	Bitumen damp proof course 200 mm wide	m	42		
G812	12 mm cement and sand (1:3) rendering on walls to smooth finish	m ²	230		
V535	3 coats of plastic emulsion paint	m ²	250		
V327	Ditto but super gloss on doors, windows etc.	m ²	60		
U521	200 mm hollow concrete blocks walling with cement mortar (1:3)	m ²	20		
O	ROOF				
O81.1	Provide and fix in position trusses to pump/Generator House	nr	20		
O81.2	Ditto purlins	m	120		
M72.1	Ditto super seven 3m prepainted Galvanized Sheets	nr	45		
M72.2	Ditto pre-painted G.S close fitting ridges	m	20		
O122	Ditto fascia boards size 175x25mm	m	50		
N294.1	Ditto, GS gutter	m	8		
N294.2	Ditto, GS gutter stop ends	nr	4		
J181	Ditto, 100 mm GS DN down-stand pipes for gutter	nr	4		
X243	Double leaf metal door frame 1.5 m wide by 2.2m high and allow for 300m long R16 metal grills	nr	2		
X9.1	Approved padlock, yale or similar	nr	4		
O132	1.2 m wide, 2.2 m high T & G door	nr	2		
X9.2	Approved lock, like yale or similar	nr	2		
W248	25 mm Vertical joint filler Polystyrene or Bondex or similar	m	20		
X234	WATER FITTINGS				
x23.1	Provide for all the water fittings and accessories	LS	1		
	Total page 6 Carried to Collection Page				

	BILL NO 02: COLLECTION PAGE				
Page No.					Amount (Kshs)
1					
2					
3					
4					
	Sub-Total for 1 Borehole (A)				
	Sub-Total for 2 Boreholes Drilling, Equipping and Fencing (B)				
5					
6					
	Sub-Total for Pump House Pages 5 & 6 (C)				
	GRAND TOTAL FOR (B) + (C) Carried to Summary Page				

BOQ NO. 3-RISING MAIN					
Item	Description	Unit	Qty	Rate (Kshs)	Amount (Kshs)
	Excavation				
E444.1	Excavate trench for 80mm diameter GI pipe depth not exc. 1.0m	m	60		
E444.2	Excavate trench for 90mm diameter HDPE pipe depth not exc. 1.0m	m	17,600		
	Supply and Deliver				
I152.1	Supply and deliver to site 80mm diameter GI Pipes. Include the cost for the required fitting	m	60		
	Supply and deliver to site 90mm diameter HDPE- PN 12.5 Pipe. Include the cost for the required fittings	M	17,600		
	Lay and Joint				
	Lay and Joint the following GI Pipe and Specials				
J161.1	80mm diameter GI Pipes	m	60		
J161.2	90mm diameter HDPE-PN 12.5 Pipes	m	17,600		
	Filing and Compaction				
E641	Backfill and compact to foundation level	m	17,600		
	Road Crossing				
H700	Provide Culverts in Road Crossings	No.	5		
R180	Reinstate road sections to original conditions	Lump Sum	LS		
	Fittings				
	Supply and install the following fittings				
J810.1	80mm diameter Gate Valve	No.	2		
	Supply and install the following fittings				
J323.1	Tee (80by 80mm)	no.	2		
J323.3	Tee (80 by 63mm)	no.	2		
	Bends diameter 100mm HDPE				
I711	111/4 ⁰ Bend	No	7		
I712	221/2 ⁰ Bend	No	4		
I713	45 ⁰ Bend	No	1		
I714	90 ⁰ Bend	No	2		
	Meter				
	Airvalves				
J527.1	diameter 37mm Double Air Valve (Complete)	No.	8		
J527.2	diameter 37mm Single Air Valve	No.	2		
	Total Page 1 Carried to bill collection page				

Water Supply					
BOQ NO. 3-RISING MAIN					
Item	Description	Unit	Quantity	Rate (Kshs)	Amount (Kshs)
	Washout				
J527.3	Allow for Washouts for diameter 100mm HDPE	No.	2	4,500	9,000
	VALVE CHAMBERS				
E334	Provide for the construction of Standard Valve Chambers	No.	12	18,300	219,600
	MISCELLANEOUS				
F223	Mass concrete, grade 15, to all thrust blocks (rate to include for all formwork and excavation).	m ³	3		
F224	Denso tape or similarly approved wrapping to 90mm PVC pipe.	m	5		
E612	Gravel surround to sluice valve	m ³	1		
K825	Supply and fix in ground including all excavation and concrete precast concrete marker posts.	No.	35		
	Testing of Pipes				
	Provide all necessary labour, equipment, water and other materials and carry out work in connection with pressure testing of mains as directed				
A274.1	80mm diameter GI Pipe	m	140		
A274.2	90mm HDPE Pipe PN 12.5	m	17,600		
	Total Page 2 Carried to bill collection page				
	COLLECTION PAGE FOR BILL NO. 3- RISING MAIN				
	Page Number				Amount in Kshs
1	Excavation and piping				
2	Pipes fittings				
	Total Bill No 3 Carried to Summary Page				

BILL NO. 4 - DISTRIBUTION SYSTEM					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
				Kshs	Kshs
	Excavation				
E443.1	Excavate trench for 63mm diameter pipe depth not exceeding 1.5m	m	5,770		
E443.2	Excavate trench for 65mm diameter GI Pipe depth not exceeding 1.5m	m	30		
	Supply and Deliver				
I166.1	Supply and deliver to site 90/65mm diameter HDPE-NP 10.5. Include the cost for the required fittings	m	5,770		
I187.1	Supply and deliver to site 65mm diameter Galvanised Steel Pipes Class B. Include the cost for the required fitting	m	30		
	Lay and Joint				
	Lay and Joint the following Pipes and Specials				
J162.1	90/65mm diameter HDPE-NP 10.5	m	5,770		
J182	65mm diameter Galvanised Steel Pipes Class B mainly in road crossings and terrains that cannot accommodate HDPE	m	30		
	Filing and Compaction				
E641	Backfill and compact to foundation level	m	5,770		
E641	Allow provisional sum to make the site good	Ls	Item		
I911	Gate Valve diameter 65mm	No.	4		
	Supply and install the following fittings				
I741.1	Tee (63 by 50mm)	No.	1		
I754	Reducer (63mm to 50mm)	No.	1		
I785	63mm/65mm Adaptor (GI/HDPE)	No.	2		
	Bends				
	For 63mm HDPE-NP 10.5				
I513	450 Bend	No	1		
I514	900 Bend	No	1		
	Meter				
I996	Provide 50mm diameter Master Meter	No	6		
	Total page 1 Carried to Bill Collection Page				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
				Kshs	Kshs
	Airvalves				
I957	diameter 25mm Double Air Valve	No.	1		
I951	diameter 25mm Single Air Valve	No.	1		
	Washout				
J527.3	Allow for Washouts	No.	2		
	VALVE CHAMBERS				
E334	Provide for the construction of Standard Valve Chambers	No.	3		
	MISCELLANEOUS				
K825	Supply and fix in ground including all excavation and concrete precast concrete marker posts.	No.	2		
	Testing of Pipes				
	Provide all necessary labour equipment, water and other materials and carry out work in connection with pressure testing of mains as directed				
A274	65mm diameter HDPE /GI Pipe	m	5,800		
	Total page 2 Carried to Bill Collection Page				

COLLECTION PAGE FOR BILL NO. 4- DISTRIBUTION MAIN				
	Page Number			Amount in Kshs
	1			
	2			
	Total Bill No 4 Carried to Summary Page			

Bill No 5: Booster Station					
BILL NO. 5 2.2: 5 by 7 Generator House					
ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS).
GENERATOR HOUSE					
E	EXCAVATION				
E311.2	Strip topsoil to a mazimum of 250 mm depth	m ³	22		
E334.1	Excavate for the slab in depth 0 - 1.5 m	m ³	8		
E334.2	Excavate trench for foundation in depths of 0-1.5m				
E612.4	Compaction for final surface under slab	m ²	63		
HARDCORE					
E642.6	200 mm thick hardcore below floor slab	m ³	20		
F711	50 mm thick murram blinding or similar	m ³	3.5		
W136	Provide and place 500 gauge polythene sheet damp proof membrane on top of quarry dust	m ²	63		
F CONCRETE					
F711	50 mm concrete Grade 15 for blinding	m ²	63		
F243.1	`Concrete grade 25 to strip footing	m ³	7		
F243.2	Ditto to ground floor slab	m ³	11		
F243.3	Ditto to 4 No plinth slabs	m ³	3		
F243.4	Ditto to ring beams	m ³	4		
G812	Provide 20 mm screed, cement and sand (1:2) to smooth finish to floor slabs	m ²	65		
G FORMWORJK					
G455.1	Sawn formwork to sides of the foundationn	m ²	100		
G455.2	Ditto to sides of walls, and entrance slab	m ²	15		
G455.3	Ditto to beams	m ²	35		
REINFORCEMENT BARS					
High Tensile to BS4449					
G524	12 mm diameter	kg	180		
G522	8 mm diametr	kg	100		
G527	A 142 mesh	m2	80		
Total page 1 Carried to Bill Collection Page					

ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS).
U	BLOCK WORK				
U521	200 mm concrete block-workk walling with cement mortar (1:3)	M	42		
W136	Bitumen damp proof course 200 mm wide	m	42		
G812	12 mm cement and sand (1:3) rendering on walls to smooth finish	m2	230		
V535	3 coats of plastic emusion paint	m2	250		
V327	Ditto but super gloss on doors, windows etc.	m2	60		
U521	200 mm hollow concrete blocks walling with cement mortar (1:3)	m2	20		
	ROOF				
O81.1	Provide and fix in position trusses to pump/Generator House	nr	20		
O81.2	Ditto purlins	m	120		
M72.1	Ditto super seven 3m prepainted Galvanized Sheets	nr	45		
M72.2	Ditto pre-painted G.S close fitting ridges	m	20		
O122	Ditto fascia boards size 175x25mm	m	50		
N294.1	Ditto, GS gutter	m	8		
N294.2	Ditto, GS gutter stop ends	nr	4		
J181	Ditto, 100 mm GS DN down-stand pipes for gutter	nr	4		
	Total Page 2 Carried to Bill Collection Page				

ITEM	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS).
X	FIXTURES				
X243	Double leaf metal door frame 1.5 m wide by 2.2m high and allow for 300m long R16 metal grills	nr	2		
X9.1	Approved padlock, yale or similar	nr	4		
O132	1.2 m wide, 2.2 m high T & G door	nr	2		
X9.2	Approved lock, like yale or similar	nr	2		
W248	25 mm Vertical joint filler Polystyrene or Bondex or similar	m	20		
	GENERATING SET				
X9	A generating set 3 phase or similar complete with suitable engine, alternator, base plate, exhaust system and control panel, with both handle and electric starting. The characteristics of the generator are as follows: Rating of Generator 45KVA with running speed of 1500-2000RPM Coupled to an equivalent Centrifugal pump	nr	1		
K1031	SOLAR UNIT				
K1031.1	Pump and accessories	Ls	1		
K1031.2	Solar Components	Ls	1		
K1031.3	Additional other accessories	Ls	1		
	FENCING				
X134.1	Precast concrete posts 2.5-3.0m high	m	132		
X134.2	Chainlink 2.5-3.0 m high anchored on the ground	Rolls	8		
X134.3	Barbed wire heavy gauge	Rolls	24		
X134.4	Double wide gate 4m wide & accessories	No	1		
X233	WATER FITTINGS				
X233.1	Provide for all the water fittings and accessories	LS	1		
	Total Page 3 Carried to Bill Collection Page				

BILL NO. 5: Booster Station					
	COLLECTION PAGE				
					Amount KSHS
	Page 1				
	Page 2				
	Page 3				
	Total Bill No 5 Carried to Summary Page				

BILL No 6: 100m3 Masonry Tank

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE KSH	AMOUNT KSH
1.1	Allow for general clearance of the site	M2	60		
1.1	Allow for removal of trees and stumps of girth 500mm-1m (provisional)	LS	Item		
1.2	Earthworks (provisional)				
1.3	Excavation for foundations max depth n.e 0.5m	M3	36		
2	Excavation for foundations max depth n.e 25m-1.5m	M3	76		
2.1	Excavation for foundation max depth n.e 1.0m-2.5m	M3	24		
2.2	Excavation for foundations max depth n.e 2.5m-3.5m	M3	24		
2.3	Allow for excavation in rock maximum depth 1.0-1.5m (provisional)	M3	10		
2.4	Allow for excavation in rock maximum depth 1.5-2.5m (provisional)	M3	10		
2.5	Allow for excavation in rock maximum depth 2.5m-3.5m (provisional)	M3	10		
2.6	Filling				
2.7	50mm thick compacted murram fill	M2	60		
3	200mm thick hand packed compacted hardcore fill	M2	60		
3.1	Provision of Concrete				
3.2	Provide concrete class 15/20 as blinding (prescribed mix ration 1:3:6)	M3	6		
3.3	Provide concrete class 25/20 for roof and floor slabs prescribed mix ratio 1:2:4)	M3	34.5		
3.4	Placing of Concrete				
3.5	C15/20 blinding for floor slab, thickness 50mm	M3	4		
	Total page 1 Carried to Bill Collection Page				

ITEM NO	ITEM DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4	Place concrete C25/20 for floor slabs, thickness n.e 150mm	M3	11		
4.1	Place concrete C25/20 for roof slabs, thickness n.e 200mm	M3	12		
4.2	Formwork				
4.3	Plane Vertical Fair Finish				
5	Formwork for sides of floor slabs	M	40		
	Formwork for sides of roof slabs	M	40		
5.1	Formwork for access void in roof slab	M	2		
5.2	Formwork: Fair Finish; Plane Sloping				
5.3	Column heads	M2	2		
6	Plane horizontal- fair finish				
6.1	Formwork to soffit of roof slabs	M2	40		
	Reinforcement				
6.2	Plain round steel bars to BS4449, nominal size 8mm (R8)	Kg	568.8		
7	Deformed high yield steel bars to BS 4449, nominal size 10mm (Y10)	Kg	892		
7.1	Deformed high yield steel bars to BS 4449, nominal size 10mm (Y12)	Kg	260		
7.2	Deformed high yield steel bards to BS 4449, nominal size 16mm (Y16)	Kg	26		
7.3	Walling				
7.4	150mm thick precast concrete block masonry wall, blocks jointed with 1:3 cement-sand mortar. Rate to include for 20mm thick 1:2 cement-sand plaster finish on both internal and external surfaces of the (concrete blocks specified size is 225x300x150 of class 20/10 concrete)	M2	110		
	Total page 2 Carried to Bill Collection Page				

ITEM NO	ITEM DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8	Water Proofing				
8.1	Cut and construct 50x50mm bondex joint as per drawing	M	32		
9	The following fittings in various components of the clear water tank (rate to include supply and delivery to site, cutting and joining materials)				
9.1	Outlet				
9.2	∅ 100mm G.I puddle flange threaded both ends	No.	1		
10	100mm plain socket	No.	2		
10.1	∅ 100mm Hex nipple	No.	2		
10.2	∅ 100mm gate valve	No.	1		
10.3	∅ 100mm G.I threaded both ends piece	No.	1		
10.4	∅ 100mm valve socket	No.	1		
10.5	Inlet				
10.6	∅ 100mm ball valve flanged	No.	1		
11	∅ 100mm flange	No.	1		
11.1	∅ 100mm plain socket	No.	3		
11.2	/ 100mm G.I puddle flange threaded both ends	No.	1		
11.3	∅ 100mm elbow (F)	No.	1		
11.4	∅ 100mm G.I threaded both ends piece	No.	1		
11.5	∅ 100mm 90o bend (F)	No.	1		
11.6	∅ 100mm elbow G.I threaded both ends	No.	1		
11.7	100mm nipple	No.	1		
11.8	100mm gate valve	No.	1		
11.9	100mm valve socket	No.	1		
	Total page 3 Carried to Bill Collection Page				

ITEM NO	ITEM DESCRIPTION	UNIT	QTY	RATE	AMOUNT
11.1.1	Washout				
11.1.2	100mm dia G.I 90o bend(flanged)	No.	1		
12	100mm dia GI pipe class 'B'	Length	1		
12.1	100mm dia sluice valve	No.	1		
12.2	100mm dia flanges	No.	2		
12.3	150x100mm dia reducer	No.	1		
12.4	Standard valve chamber	No.	1		
12.5	150x100mm dia reducer	No.	1		
12.6	Painting works (Rate to include supply)				
12.7	Apply 2-coats of Bituminous paint (provisional)	M2	45		
13	Distemper white paint	M2	80		
13.1	Air Vent				
13.2	75mm dia equal tee	No.	4		
13.3	75mm dia nipple	No.	6		
13.4	75mm dia elbow	No.	4		
13.5	Mosquito gauze	No.	1		
13.6	Ladder				
13.7	Allow for fabrication and installation of access ladder of length about 3m as indicated	No.	1		
14	Pipeline laying & allied works	LS	Item		
	Total page 4 Carried to Bill Collection Page				

BILL NO. 6: Masonry Tank					
	COLLECTION PAGE				
					Amount KSHS
	Page 1				
	Page 2				
	Page 3				
	Page 4				
	Total Bill No 6 Carried to Summary Page				

BILL NO. 7: 10m LONG 0.6m HIGH CATTLE TROUGH					
Item	Description	Unit	Quantity	Rate	Amount
CLASS D :SITE CLEARANCE					
D100	General site clearance, include for any additional clearance required	m2	60		
D200	Setting out the works	sum	1		
CLASS E : EARTHWORKS					
	Excavation shall include for strutting, shuttering, stabilising excavated surfaces and keeping excavations free of water by bailing out, pumping or other means and preparation of the excavated surfaces (excluding disposal of excavated material)				
Excavation for Foundations					
E311	Topsoil; depth not exceeding 0.25m	m ³	15		
E322	Material other than topsoil, rock or artificial hard material maxium depth 0.25-0.8	m ³	48		
E334	Rock or murrum material, depth 0.5 - 0.8m (provisional)	m ³	1		
Excavation Ancillaries					
	<i>Preparation of Excavated Surfaces(mainly by compaction of thefinal surface nd removal of any lose material)</i>				
E522	Materials other than topsoil, rock or artificial hard material	m ²	60		
E523	Rock or murrum surface (provisional)	m ²	2		
Total page 1 Carried to Bill Collection Page					

Item	Description	Unit	Quantity	Rate	Amount
	<i>Disposal of Excacated Material</i>				
	Approved material shall be retained for fill and unsuitable material shall be disposed 100m away from the site as agreed with				
E531	Topsoil	m ³	15		
E532	Material other than topsoil, rock or artificial hard material	m ³	24		
E533	Rock material (provisional)	m ³	1		
	Filling				
	<i>Filling to complete structures including compaction</i>				
E614	Selected excacated material other than topsoil, rock or artificial hard material.	m ³	24		
E647	Filling with imported stone material , thickness n.e 250mm, include for providing and jointing with mortar(mix ratio1:3) to create stone pitching around the trough(provisional)	m2	65		
E647	Filling with imported hardcore/stone material , thickness n.e 500mm	m3	30		
	CLASS F : CONCRETE				
	<i>(Class15 mix ratio 1:3:6)(Class 25 mix ratio be 1:1.5:3)</i>				
	<i>maximum size of aggregate=20mm</i>				
	Provision of Concrete				
	Provide materials and mix concrete to the specified class;				
	cement to BS 12 or BS 146				
F403.1	Prescribed mix; Class C15	m ³	0.6		
	Total page 2 Carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount
E403.2	Prescribed mix; Class C25	m ³	3.50		
	Placing of Concrete				
	Place, vibrate and cure concrete in the following				
	elements of the structure as per details on drawings.				
	<i>Mass Concrete; Class 15</i>				
F511	Blinding under bed slab;thickness not exceeding 150mm (C15)	m ³	0.6		
``	<i>Reinforced Concrete; Class 25</i>				
	In ground slab				
	Dimensions as per details on drawings				
F621	Slab, thickness ,thickness 150mm	m ³	3.5		
	CLASS G: CONCRETE ANCILLARIES				
	Dimensions as per details on Drawings of specific				
	structural components				
	Forwork: Fair Finish				
	Plane Vertical to faces of side walls				
G242	Slab; width 0.15m	m2	7		
	Reinforcement				
	All reinforcement to comply with BS 4449				
G522	Fabric mesh type A142 to floor slab	m2	12		
G812	Finishing of top surfaces with steel trowel	m2	12.5		
	Total page 3 Carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount
	CLASS U: BRICKWORK, BLOCK WORK AND MASONRY				
	To include supplying materials and erecting masonry				
	walls jointed with mortar, mix ratio 1:3				
U721	Dressed masonry vertical straight walls, thickness 250mm (provisional)	m2	12		
U722	10mm thick plaster for the masonry works, (rate to include for use of waterproofing admixture or waterproof cement) (provisional)	m2	28		
	CLASS Z: SIMPLE BUILDING WORKS INCIDENTAL TO CIVIL ENGINEERING WORKS				
	Surface Finishes				
Z411	Cement/sand 10mm screed on slab	m2	12		
Z413	Cement/sand 20mm plaster on side walls with cement containing a waterproofing admixture	m2	30		
	CLASS J: PIPEWORK-FITTINGS AND VALVES				
	Rate to include supplying of materials/fittings, fitting in position, and testing				
	Iron or steel pipe fittings				
J811	Gate valve, nominal bore 25mm	nr	2		
J311	Elbow, nominal bore 25mm	nr	2		
J331	50X25 reducing bush, nominal bore 25mm	nr	1		
J321	Equal tee, nominal bore 25mm	nr	1		
J341	Puddle flange, nominal bore 50mm (provisional)	nr	1		
	Total page 4 Carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount
	CLASS I: PIPEWORK-PIPES				
	(Rate to include provision, laying , jointing , and testing of pipes and pipelines)				
	<i>Pipes not in trenches</i>				
J411.1	Galvanised iron pipe class B, nominal bore 25mm	m	1.5		
J411.2	Galvanised iron pipe class B, nominal bore 50mm	m	1.5		
	<i>Pipes in trenches</i>				
J412	2 inch uPVC pipes class D in 500mm wide trench, depth not exceeding 1.5m	m	50		
	CLASS K: PIPEWORK & OTHER ANCILLARIES				
K113	Provide and fix 4mm thick tight fitting steel cover to the inlet chamber as per the drawings	Sum	1		
	Total page 5 Carried to Bill Collection Page				

BILL NO. 7: Cattle Troughs					
COLLECTION PAGE					
					Amount KSHS
	Page 1				
	Page 2				
	Page 3				
	Page 4				
	Page 5				
	Total for 1 No Cattle Trough(A)				
	Total for 4 No Cattle Trough(B)				
	Total Bill No 7 Carried to Summary Page(B)				

BILL NO 08: ELEVATED STEEL TANK

Item	Description	Unit	Qty	Rate	Amount
1	EXCAVATION AND EARTH WORKS				
E41	General site clearance	Item	1	20,000	20,000
E42	Cutting of trees, removal of stumps with holes backfilled with excavated material	Item			
E43	Trees, girth 500mm -1.0m	No.	5	2000	10,000
	CLASS C: EARTHWORKS				
	Excavation for tank foundations				
E44	Excavation for tank foundations in materials other than rock, depth 2-5m3	M ³	200	330	66,000
E45	Excavation for tank foundations in material other than rock, depth 2-5m		32	400	12,800
E46	Compacted filling to foundations with selected excavated material other than topsoil or rock	M ³	320	600	192,000
	CLASS D: INSITU CONCRETE				
	RC TANK FOUNDATIONS				
E49	Supply and install DN50 steel inlet pipework complete as shown on the Drawings including ball float, with flanges to BS4504. The pipework to terminate at the connection with the main supply line.		1	50,000	50,000
E50	Supply and install DN50 steel outlet pipework complete as shown on the Drawings with flanges to BS4504. The pipework to terminate at the connection with inlet pipework.		1	87,900	87,900
E51	Supply and install DN 50 steel overflow with bell mouth and DN 100 drainage pipework including gate valve complete as shown on the drawings with flanges to BS4504. The pipework to terminate at the overflow chamber.	no	1	50,000	50,000
	Total page 1 Carried to Bill Collection Page				

Item	Description	Unit	Qty	Rate	Amount
	CLASS F: STRUCTURAL STEEL WORK				
E52	Design to BS449, fabricate, and supply ex-works 12m high steel structure tower designed to take sectional steel tank 75m ³ capacity when full of water. Tower to standard finish of 1 coat zinc chromate prime backed by 2 coats of aluminium paint.	no	1	750,000	750,000
E53	Design to BS1564, fabricate, and supply ex-works pressed water steel tank 75m ³ capacity when full of water complete with roof	no	1	1,400,000	1,400,000
E54	Transport to site and erect the tank tower and assemble on the tower 75m ³ pressed steel tanks complete with access ladders, walkway and hand railing, access cover and roof vent.	no	1	200,000	200,000
E55	Fabricate, supply ex-works 1m wide walkway with 1.2m high railings. Walkway to standard finish 1 coat zinc chromate primer backed by 2 coats aluminium paint.	no	1	39,500	39,500
E56	Fabricant, supply ex-works internal access ladder. Ladder to standard finish 1 coat primer and 2 coats non-toxic bituminous paint.	no	1	16,500	16,500
E57	Fabricate, supply ex-works external access ladder with safety hoops. Ladders to standard finish 1 coat zinc chromate primer backed by 2 coats aluminium paint.	no	1	116,500	116,500
	SUB TOTAL				
	SITE WORKS				
E58	overflow reinforced concrete collection chamber complete as shown on the drawings with cover depth 1.5-2.0m	no	3	18,900	18,900
E59	Overflow drain discharge headwall complete	No.	1	760	760
	Total page 2 Carried to Bill Collection Page				

Item	Description	Unit	Qty	Rate	Amount
	Testing and Sterilising				
E60	Water tightness testing, cleansing and sterilization of 75m ³ elevated tan as per specifications	No.	1		
E61	Allow provisional sum for construction of valve chambers and procurement of auxiliary items pipes and fittings	Item	Sum		
	Total page 3 Carried to Bill Collection Page				

BILL NO. 8: Elevated Steel Tank					
	BILL COLLECTION PAGE				
					Amount KSHS
	Page 1				
	Page 2				
	Page 3				
	Total Bill No 8 Carried to Summary Page				

BILL NO 09: WATER KIOSKS

Item	Description	Unit	Qty	Rate	Amount
Lx8.0	Water Kiosks				
Lx8.1.1	FLOOR				
Lx8.1.2	Hardcore	Ton	7		
Lx8.1.3	Ordinary Portland Cement	Bag	30		
Lx8.1.4	Ballast	Ton	2		
Lx8.1.5	Building sand	Ton	4		
Lx8.1.6	Timber 100x25mm	Ft	600		
	WALLING				
Lx8.1.7	Blocks 225x150mm	no	400		
Lx8.1.8	Ordinary Portland Cement	Bag	10		
Lx8.1.9	Building sand	Ton	2		
Lx8.1.10	1000x2100 T&G timber door with frame	No	1		
Lx8.1.11	1000x750mm T&G timber window with frame	No	1		
	ROOFING				
Lx8.1.12	Supply all materials to construct a Reinforced concrete 100mm roof slab	LS	1		
Lx8.1.14	PLASTER & FLOOR SCREED				
Lx8.1.15	Ordinary Portland cement	Bag	3		
Lx8.1.16	Building sand	Ton	5		
	FITTINGS				
Lx8.1.17	25mm dia. Gate valve (peglar)	No	1		
Lx8.1.18	25mm dia. G.I nipple	No	3		
Lx8.1.19	25mm dia. Socket union	No	1		
Lx8.1.20	25mm dia. Water meter	No	1		
Lx8.1.21	25mm dia. Bib tap (peglar)	No	1		
Lx8.1.22	40mm dia. G.I. Equal tee	No	1		
Lx8.1.23	40mmx25mm G.I. Red. Bush	No	1		
Lx8.1.24	25mm dia.G.I. pipe class C	pc	1		
Lx8.1.25	25mm dia. G.I elbow	No	6		
	Total for 1 No Kiosk				
	Total for 8 No Kiosk carried to Summary Page				

BILL NO 10: VIP LATRINE

MX 9.0 - LATRINE CUM BATHROOM					
Item	Description	Unit	Quantity	Rate	Amount (Kshs)
	CLASS.A: GENERAL ITEMS				
MX 9.1.1	Setting out the works	Sum	1		
	CLASS.D: DEMOLITION AND SITE CLEARANCE				
MX 9.1.2	General site clearance, include for any additional clearance required	m ²	9		
	CLASS E: EARTHWORKS				
	Excavation shall include for strutting, shutting, stabilising excavated surfaces and keeping excavations free of water by bailing out, pumping or other means and preparation of the excavated surfaces (excluding disposal of excavated material)				
	General Excavation for pit latrine and soakpit (soak pit dimensions n.e 1.5x1.5x1.5m deep)				
MX 9.1.3	Top soil: depth n.e.0.25m	m ³	3.5		
MX 9.1.4	Material other than topsoil, rock or artificial hard material maximum depth 0.25-0.5m	m ³	3.5		
MX 9.1.5	Material other than topsoil, rock or artificial hard material maximum depth 0.5-1.0m	m ³	3		
MX 9.1.6	Material other than topsoil, rock or artificial hard material maximum depth 1.0-2.0m	m ³	5		
MX 9.1.7	Material other than topsoil, rock or artificial hard material maximum depth 2.0-5.0m	m ³	11		
MX 9.1.7	Rock lmaterial, maximum depth 1.0-5.0m(provisional)	m ³	1		
MX 9.1.8	Murram material (provisional)	m ³	5		
	Total Page 1 carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount (Kshs)
	Excavation Ancillaries				
MX 9.1.10	Preparatio of excavated surfaces (rate to include for removal of loose material and compaction)	m ³	1		
MX 9.1.11	Materials other than topsoil, rock or artificial hard material	m ²	4		
MX 9.1.12	Rock surface	m ²	0.5		
	Disposal of excavated material				
	Approved material shall be retained for filling and unsuitable material shall be disposed to tip as directed by the Supervisor but haul distance shall not exceed 1000m				
MX 9.1.13	Topsoil	m ³	3.5		
MX 9.1.14	Material othern than topsoil, rock or artificial hard material	m ³	20		
MX 9.1.15	Rock material	m ³	1		
	Filling				
MX 9.1.16	Filling to complete structures including compaction as specified				
MX 9.1.17	Selected excavated material other than topsoil, rock or artificial hard material	m ³	2.5		
MX 9.1.18	Imported rock for hardcore to be placed in soakpit and under slab	m ³	12		
	CLASS.F: IN SITU CONCRET				
	Provision of Concrete				
	Provide materials and mix concrete to the specified class; cement to BS 12 or BS 146				
	Class 15, 1:3:6 mix ratio, Class 20-1:2:4 mix ratio				
MX 9.1.19	Prescribed mix; grade C15	m ³	0.5		
MX 9.1.20	Prescribed mix; grade C20	m ³	2.5		
	Total Page 2 carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount (Kshs)
	Placing of Concrete				
	Place, compact and cure concrete in the following elements of the structure as per details on drawings				
	Mass concrete; Class 15				
MX 9.1.21	Blinding under walls, bases, slabs and footings; thickness 50mm	m ³	0.5		
	Reinforced concret; Class 20				
	Beams, bases, footings and walking slab				
	Dimensions as per details on drawings				
MX 9.1.22	Slabs; thickness 100mm	m ³	2		
MX 9.1.23	200 x 200mm ring beam	m ³	0.5		
	Pipework				
	Rate to include provision, laying, fixing the pipe in the correct position, excavating and backfilling the pipe trench and testing				
MX 9.1.24	4 inch waste pipe class 41 to soakpit in trench 600 x 600mm	m	4		
	CLASS.G: CONCRETE ANCILLARIES				
	Dimensions as per details on drawings of specific structural				
	Formwork: Fair Finish				
MX 9.1.25	External sides of slabs; width not exceeding 200mm	m ²	5		
MX 9.1.26	External sides of beams; width not exceeding 200mm	m ²	5		
	Reinforcement				
	Rate to include for cutting, bending, supporting, tying and securing reinforcement				
MX 9.1.26	Y8 for beam stir ups	kg	25		
MX 9.1.27	High yield steel, nominal size Y10 for floor and roof slabs	kg	50		
MX 9.1.28	Y12 main bars for ring beam	kg	30		
MX 9.1.29	Steel fabric mesh reinforcement to BS4483 ref.A142 in slabs(provisional)	m2	15		
	Total Page 3 carried to Bill Collection Page				

Item	Description	Unit	Quantity	Rate	Amount (Kshs)
MX 9.1.30	Finishing of top surfaces of slab and walkway with steel trowel	m2	4		
	CLASS.U: BRICKWORK, BLOCK WORK AND MASONRY				
	To include supplying materials and erecting masonry wall lining in latrine pit up to ground level as directed				
MX 9.1.31	Machine cut stone masonry vertical straight walls, thickness 150mm-200mm	m ²	60.08		
	CLASS.Z: SIMPLE BUILDING WORKS INCIDENTAL TO CIVIL ENGINEERING WORKS				
QX 10.1	Surface Finishes				
QX 10.1.1	Cement/sand 20mm screed on walkway slab	m ²	5		
QX 10.1.2	10mm thick 1:3 cement/sand plaster to interior surface of superstructure walling	m ²	25		
QX 10.1.3	Painting plastered interior surface of superstructure walling with 3 coats(1 u/c + 2 f/c) of plastic emulsion paint	m ²	25		
	Doors and Padlocks				
QX 10.1.5	850 x 2100 tongued and grooved (T&G) door (rate to include for 100x50mm door frames and all iron mongery)	No.	2		
QX 10.1.6	Provisional sum for purchase of locks and padlocks as directed by the supervisor	Sum	1		
QX 10.1.7	Percentage adjustment to provisional sum for purchase of a padlock	%	1000		
	Windows and Ventilations				
QX 10.1.8	Precast concrete vent block size 450x450mm for permanent ventilations	No.	2		
QX 10.1.9	Nominal bore 100mm medium gauge plastics vent pipe (rate to include for fly screen at the top)	No.	1		
	Total Page 4 carried to Bill Collection Page				

BILL NO. 10: VIP LATRINES				
	BILL COLLECTION PAGE			
				Amount KSHS
	Page 1			
	Page 2			
	Page 3			
	Page 4			
	Subtotal for 1 Latrine			
	Total 4 No Latrines Carried to Summary Page			

BILL NO.	DESCRIPTION		AMOUNT (KSHS)
1	Preliminary and General Items		
2	Borehole Drilling, Equipping and Fencing		
3	Bilatulamin ws Rising Main (90mm GI/HDPE- 17.60km)		
4	Distribution System		
5	Booster Station		
6	100m3 Masonry Tank		
7	Livestock Cattle Troughs		
8	1No 75m3 elevated steel tank-Rehabilitation Works		
9	Water Kiosks-8no.		
10	VIP Latrine-4no.		
	Sub-Total Kes		
	Add 2.5% Contingency sum		
	Add 16% VAT (Inclusive)		
	GRAND TOTAL		
	GRAND TOTAL		

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 works** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.
- m) **A Defect** is any part of the Works not completed in accordance with the Contract.
- n) **The Defects Liability Certificate** is the certificate issued by Project Manager upon correction of defects by the Contractor.
- o) **The Defects Liability Period** is the period **named in the SCC** pursuant to Sub-Clause 34.1 and calculated from the Completion Date.
- p) **Drawings** means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Procuring Entity in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.
- q) **The Procuring Entity** is the party who employs the Contractor to carry out the Works, **as specified in the SCC**, who is also the Procuring Entity.
- r) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.
- s) **"In writing" or "written"** means hand-written, type-written, printed or electronically made, and

- resulting in a permanent record;
- t) The Initial Contract Price is the Contract Price listed in the Procuring Entity's Letter of Acceptance.
 - u) **The Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is **specified in the SCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.
 - v) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works.
 - w) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
 - x) **The Project Manager** is the person **named in the SCC** (or any other competent person appointed by the Procuring Entity and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.
 - y) **SCC** means Special Conditions of Contract.
 - z) **The Site** is the area of the works as **defined as such in the SCC**.
 - aa) **Site Investigation Reports** are those that were included in the bidding document and are factual and interpretative reports about the surface and subsurface conditions at the Site.
 - bb) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.
 - cc) **The Start Date** is **given in the SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.
 - dd) **A Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.
 - ee) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.
 - ff) **A Variation** is an instruction given by the Project Manager which varies the Works.
 - gg) **The Works** are what the Contract requires the Contractor to construct, install, and turn over to the Procuring Entity, **as defined in the SCC**.

2 Interpretation

- 21 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.
- 22 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).
- 23 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 Quantities⁶, 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 and Law

- 3.1 The language of the Contract is English Language and the law governing the Contract are the Laws of Kenya.
- 3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Procuring Entity's Country when
 - a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country; or
 - b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods from that country or any payments to any country, person, or entity in that country.

4. Project Manager's Decisions

- 4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Procuring Entity and the Contractor in the role representing the Procuring Entity.

5. Delegation

- 5.1 Otherwise **specified in the SCC**, the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.

6. Communications

- 6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

- 7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Procuring Entity in writing. Subcontracting shall not alter the Contractor's obligations.

8. Other Contractors

- 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Procuring Entity between the dates given in the Schedule of Other Contractors, as **referred to in the SCC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Procuring Entity may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

9. Personnel and Equipment

- 9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
- 9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.
- 9.3 If the Procuring Entity, Project Manager or Contractor determines, that any employee of the Contractor be determined to have engaged in Fraud and Corruption during the execution of the Works, then that employee shall be removed in accordance with Clause 9.2 above.

10. Procuring Entity's and Contractor's Risks

- 10.1 The Procuring Entity carries the risks which this Contract states are Procuring Entity's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Procuring Entity's Risks

- 11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Procuring Entity's risks:
- a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to
 - i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or
 - ii) negligence, breach of statutory duty, or interference with any legal right by the Procuring Entity or by any person employed by or contracted to him except the Contractor.
 - b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Procuring Entity or in the Procuring Entity's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
- 11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is a Procuring Entity's risk except loss or damage due to
- aa) a Defect which existed on the Completion Date,
 - bb) an event occurring before the Completion Date, which was not itself a Procuring Entity's risk, or
 - cc) the activities of the Contractor on the Site after the Completion Date.

12. Contractor's Risks

- 12.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Procuring Entity's risks are Contractor's risks.

13. Insurance

- 13.1 The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the SCC** for the following events which are due to the Contractor's risks:
- a) loss of or damage to the Works, Plant, and Materials;
 - b) loss of or damage to Equipment;
 - c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
 - d) personal injury or death.
- 13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.
- 13.3 If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may 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.

245 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.

246 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.

247 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.

248 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.

264 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 Price⁷

- 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 Price⁸

- 37.1 If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Procuring Entity.
- 37.2 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

38. Variations

- 38.1 All Variations shall be included in updated Programs⁹ produced by the Contractor.
- 38.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.
- 38.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.
- 38.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

⁷In lump sum contracts, replace GCC Sub-Clauses 36.1 as follows:

36.1 The Contractor shall provide updated Activity Schedules within 14 days of being instructed to by the Project Manager. The Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for materials on site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

⁸In lump sum contracts, replace entire GCC Clause 37 with new GCC Sub-Clause 37.1, as follows:

The Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

⁹In lump sum contracts, add "and Activity Schedules" after "Programs." ¹⁰In lump sum contracts, delete this paragraph.

- 385 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning
- 386 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
- 387 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.
- 388 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.
- 389 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 Program¹¹, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

40. Payment Certificates

- 40.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
- 40.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 40.3 The value of work executed shall be determined by the Project Manager.
- 40.4 The value of work executed shall comprise the value of the quantities of work in the Bill of Quantities that have been completed¹².
- 40.5 The value of work executed shall include the valuation of Variations and Compensation Events.
- 40.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
- 40.7 Where the contract price is different from the corrected tender price, in order to ensure the contractor is not paid less or more relative to the contract price (which would be the tender price), payment valuation certificates and variation orders on omissions and additions valued based on rates in the Bill of Quantities or schedule of rates in the Tender, will be adjusted by a plus or minus percentage. The percentage already worked out during tender evaluation is worked out as follows: $(\text{corrected tender price} - \text{tender price}) / \text{tender price} \times 100$.

41. Payments

- 41.1 Payments shall be adjusted for deductions for advance payments and retention. The Procuring Entity shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of each certificate. If the Procuring Entity makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.
- 41.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 41.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
- 41.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Procuring Entity and shall be deemed covered by other rates and prices in the Contract.

42. Compensation Events

42.1 The following shall be Compensation Events:

- d) The Procuring Entity does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.
- e) The Procuring Entity modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
- f) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.
- g) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
- h) The Project Manager unreasonably does not approve a subcontract to be let.
- i) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.
- j) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Procuring Entity, or additional work required for safety or other reasons.
- k) Other contractors, public authorities, utilities, or the Procuring Entity does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- l) The advance payment is delayed.
- m) The effects on the Contractor of any of the Procuring Entity's Risks.
- n) The Project Manager unreasonably delays issuing a Certificate of Completion.

42.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

42.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.

¹¹In lump sum contracts, add "or Activity Schedule" after "Program."

¹²In lump sum contracts, replace this paragraph with the following: "The value of work executed shall comprise the value of completed activities in the Activity Schedule."

424 The Contractor shall not be entitled to compensation to the extent that the Procuring Entity's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

43. Tax

43.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 30 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 44.

44. Currency of Payment

44.1 All payments under the contract shall be made in Kenya Shillings

45. Price Adjustment

45.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC**. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type specified below applies:

$$P = A + B I_m/I_o$$

where:

the Contract Price payable.

P is the adjustment factor for the portion of

A and B are coefficients¹³ **specified in the SCC**, representing the non-adjustable and adjustable portions, respectively, of the Contract Price payable and I_m is the index prevailing at the end of the month being invoiced and I_o is the index prevailing 30 days before Bid opening for inputs payable.

45.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

46. Retention

46.1 The Procuring Entity shall retain from each payment due to the Contractor the proportion stated in the **SCC** until Completion of the whole of the Works.

46.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 53.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an "on demand" Bank guarantee.

47. Liquidated Damages

47.1 The Contractor shall pay liquidated damages to the Procuring Entity at the rate per day stated in the **SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount defined in the **SCC**. The Procuring Entity may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

47.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 41.1.

48. Bonus

48.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the SCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.

49. Advance Payment

- 49.1 The Procuring Entity shall make advance payment to the Contractor of the amounts stated in the SCC by the date stated in the SCC, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Procuring Entity in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.
- 49.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.
- 49.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.

50. Securities

- 50.1 The Performance Security shall be provided to the Procuring Entity no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the SCC**, by a bank or surety acceptable to the Procuring Entity, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 day from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Completion Certificate in the case of a Performance Bond.

51. Dayworks

- 51.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
- 51.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.
- 51.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

52. Cost of Repairs

- 52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

53. Completion

- 53.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is completed.

54. Taking Over

- 54.1 The Procuring Entity shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

55. Final Account

- 55.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.

¹³The sum of the two coefficients A and B should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient A, for the non-adjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other non-adjustable components. The sum of the adjustments for each currency are added to the Contract Price.

56. Operating and Maintenance Manuals

56.1 If “as built” Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the SCC.

56.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the SCC pursuant to GCC Sub-Clause 56.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the SCC** from payments due to the Contractor.

57. Termination

57.1 The Procuring Entity or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

57.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:

- a) the Contractor stops work for 30 days when no stoppage of work is shown on the current Program and the stoppage 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 was made.

SECTION IX - SPECIAL CONDITIONS OF CONTRACT

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 NORTHERN WATER WORKS DEVELOPMENT AGENCY Maji House, Kismayu Road PO Box 495 – 70100 Garissa, Kenya Tel: +254-46-2103598/3797 E-mail: info@nwwda.go.ke																					
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be After 8 calendar Months																					
GCC 1.1 (x)	The Project Manager is The Technical Services Manager NWWDA																					
GCC 1.1 (z)	The Site is located at Bilatulamin ward, in Eldas Constituency in Wajir County																					
GCC 1.1 (cc)	The Start Date shall be after contract signature																					
GCC 1.1 (gg)	The Works consist of <ul style="list-style-type: none"> • Borehole Drilling, Equipping and Fencing • Bilatulamin ws Rising Main (90mm GI/HDPE- 17.60km) • Distribution System • Booster Station • 100m3 Masonry Tank • Livestock Cattle Troughs • 1No 75m3 elevated steel tank-Rehabilitation Works • Water Kiosks-8no. • VIP Latrine-4no. 																					
GCC 2.2	Sectional Completions are: <i>N/A</i>																					
GCC 5.1	The Project manager <i>may</i> delegate any of his duties and responsibilities.																					
GCC 8.1	Schedule of other contractors: <i>N/A</i>																					
GCC 9.1	<p>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.</p> <table border="1" data-bbox="387 1749 1394 2078"> <thead> <tr> <th>No.</th> <th>Position</th> <th>Qualifications</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Contractor’s Representative / Site Agent- One (1 Nr)</td> <td>• Degree in Civil Engineering</td> </tr> <tr> <td>2</td> <td>Surveyor- One (1 Nr)</td> <td>• Diploma in Survey or equivalent</td> </tr> <tr> <td>3</td> <td>General Foreman (1No)</td> <td>• Diploma in Civil Engineering</td> </tr> <tr> <td>4</td> <td>Plumber - One (1 Nr)</td> <td>• Certificate in plumbing</td> </tr> <tr> <td>5</td> <td>Drivers - Two (2Nr)</td> <td>• Driving License</td> </tr> <tr> <td>6</td> <td>Mason - one (1Nr)</td> <td>• Certificate in Masonry</td> </tr> </tbody> </table>	No.	Position	Qualifications	1	Contractor’s Representative / Site Agent- One (1 Nr)	• Degree in Civil Engineering	2	Surveyor- One (1 Nr)	• Diploma in Survey or equivalent	3	General Foreman (1No)	• Diploma in Civil Engineering	4	Plumber - One (1 Nr)	• Certificate in plumbing	5	Drivers - Two (2Nr)	• Driving License	6	Mason - one (1Nr)	• Certificate in Masonry
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5	Drivers - Two (2Nr)	• Driving License																				
6	Mason - one (1Nr)	• Certificate in Masonry																				
GCC 13.1	The minimum insurance amounts and deductibles shall be:																					

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	<p>(a) For loss or damage to the Works, Plant and Materials: Equivalent to contract price;</p> <p>(b) For loss or damage to Equipment: KES 10 Million</p> <p>(c) For loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract KES 10 Million</p> <p>(d) For personal injury or death:</p> <p>(i) of the Contractor’s employees: KES 5 Million</p> <p>(ii) of other people: Kshs5 million: KES 5 Million</p>
GCC 14.1	Site Data are: The bidder shall rely on the provided contract drawings and physical site inspections and investigations by the bidder.
GCC 20.1	The Site Possession Date(s) shall be: Within 14 days of the Commencement Date
GCC 23.1 & GCC 23.2	<p>Appointing Authority for</p> <p>The Kenya Chapter of the Chartered Institute of Arbitrators, P.O Box 50163-00200, Nairobi.</p> <hr/> <p>Hourly rate and types of reimbursable expenses to be paid to the Adjudicator:</p> <p>Kshs. 25,000/-</p>
B. Time Control	
GCC 26.1	The Contractor shall submit for approval a Program for the Works within <i>14</i> days from the date of the Letter of Acceptance.
GCC 26.3	<p>The period between Program updates is Monthly</p> <p>The amount to be withheld for late submission of an updated Program is</p> <p>KES 100,000</p> <p>The period for submission of progress reports is Monthly</p>
C. Quality Control	
GCC 34.1	The Defects Liability Period is: 8 Months (240 Days).
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 N/A
GCC 41.3	Payments certificates shall be approved upon attainment of 20% milestone of the contract sum
GCC 44.1	The currency of the Procuring Entity’s 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.
GCC 46.1	<p>The proportion of payments retained is: 10%</p> <p>Limit of Retention: 5% of Accepted Contract Amount (inclusive of VAT)</p>
GCC 47.1	The liquidated damages for the whole of the Works are five (0.05%) of final Contract Price per day. The maximum amount of liquidated damages for the whole of the Works is 5%

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	of the final Contract Price
GCC 49.1	The Advance Payments shall be: <i>N/A</i>
GCC 50.1	<p>The Performance Security amount is:</p> <p>(a) Performance Security – Bank Guarantee (unconditional and on demand): in the amount(s) of ten (10) percent of the Accepted Contract Amount and in the same currency (ies) of the Accepted Contract Amount.</p> <p>(b) Performance Security – Performance Bond: N/A .</p>
E. Finishing the Contract	
GCC 56.1	<p>The date by which operating and maintenance manuals are required is</p> <p>30 days after substantial completion.</p> <p>The date by which “as built” drawings are required is</p> <p>30 days after substantial completion.</p>
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 Sub-Clause 58.1 is KES 100, 000/-
GCC 57.2 (g)	The maximum number of days is: 90 Days
GCC 58.1	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is 15% (Fifteen Percent)

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 **Northern Water Works Development Agency**
- ii) Project: **El Nur Water Supply Project**
- iii) Contract title: **El Nur Water Supply Project**
- iv) Country: **Kenya**

- v) ITT No: **NWWDA/T/CW/006/20212022**

- vi) 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 ofdated the...day of20.....in the matter of Tender No.....of20..... for(Tender description).

REQUEST FOR REVIEW

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

- 1.
- 2.

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

- 1.
- 2.

SIGNED(Applicant) Dated on.....day of/...20.....

FOR OFFICIAL USE ONLY Lodged with the Secretary Public Procurement Administrative Review Board on.....day of20.....

SIGNED

Board Secretary

FORM NO 3: LETTER OF AWARD

[letterhead paper of the Procuring Entity] [date]

To: *[name and address of the Contractor]*

This is to notify you that your Tender dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Tenderers, is hereby accepted by (*name of Procuring Entity*).

You are requested to furnish the Performance Security within 30 days in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VIII, Contract Forms, of the Tender Document.

Authorized Signature:.....

Name and Title of Signatory:.....

Name of Procuring Entity.....

Attachment: *Contract Agreement*.....

FORM NO 4: CONTRACT AGREEMENT

THIS AGREEMENT made the _____ day of _____, **2022**, between **Northern Water Works Development Agency** hereinafter “the Procuring Entity of the one part, and of _____ (hereinafter “the Contractor”), of the other part:

WHEREAS the Procuring Entity desires that the Works known as _____ should be executed by the Contractor, and has accepted a Tender by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Procuring Entity and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - a) the Letter of Acceptance
 - b) the Letter of Tender
 - c) the addenda Nos _____ (if any)
 - d) the Special Conditions of Contract
 - e) the General Conditions of Contract;
 - f) the Specifications
 - g) the Drawings; and
 - h) the completed Schedules and any other documents forming part of the contract.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Procuring Entity to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Procuring Entity hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the Laws of Kenya on the day, month and year specified above.

Signed and sealed by _____ (for the Procuring Entity)

Signed and sealed by _____ (for the Contractor).

FORM NO. 5 - PERFORMANCE SECURITY

[Option 1 - Unconditional Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ *[insert name and Address of Procuring Entity]* **Date:** _____

_____ *[Insert date of issue]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with (name of Procuring Entity) _____ (the Procuring Entity as the Beneficiary), for the execution of _____ (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.
3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (in words),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.
4. This guarantee shall expire, no later than the Day of, 2.....², and any demand for payment under it must be received by us at the office indicated above on or before that date.
5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months]* *[one year]*, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

[Name of Authorized Official, signature(s) and seals/stamps].

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

¹The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.

²Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM No. 6 - PERFORMANCE SECURITY

[Option 2– Performance Bond]

[Note: Procuring Entities are advised to use Performance Security – Unconditional Demand Bank Guarantee instead of Performance Bond due to difficulties involved in calling Bond holder to action]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Northern Water Works Development Agency] Date: __*[Insert date of issue]*.

PERFORMANCE BONDNo.:_____

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 **Northern Water Works Development Agency** 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 behalf of By ___ in the capacity of In the presence of

SIGNED ON _____ on behalf of By ___ in the capacity of In the presence of

FORM NO. 7 - ADVANCE PAYMENT SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ *[Insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: _____ *[Insert guarantee reference number]* **Guarantor:** _____
_____ *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (in words) is to be made against an advance payment guarantee.
3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (in words _____)¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:
 - a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
 - b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Contractor on its account number _____ at _____.
5. The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the ____ day of _____, 2², whichever is earlier. Consequently, demand for payment under this guarantee must be received by us at this office on or before that date.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months]*/*[one year]*, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

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

¹The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency of the advance payment as specified in the Contract.

²Insert the expected expiration date of the Time for Completion. The Procuring Entity should note that in the event of an extension of the time for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 8 - RETENTION MONEY SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ *[Insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

Advance payment guarantee no. *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that _____ *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Contractor") has entered into Contract No. _____ *[insert reference number of the contract]* dated _____ with the Beneficiary, for the execution of _____ *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, and payment of *[insert the second half of the Retention Money]* is to be made against a Retention Money guarantee.
3. At the request of the Contractor, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* _____ *([insert amount in words _____])*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.

¹The Guarantor shall insert an amount representing the amount of the second half of the Retention Money.

²Insert a date that is twenty-eight days after the expiry of retention period after the actual completion date of the contract. The Procuring Entity should note that in the

event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.

FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM

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 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]”

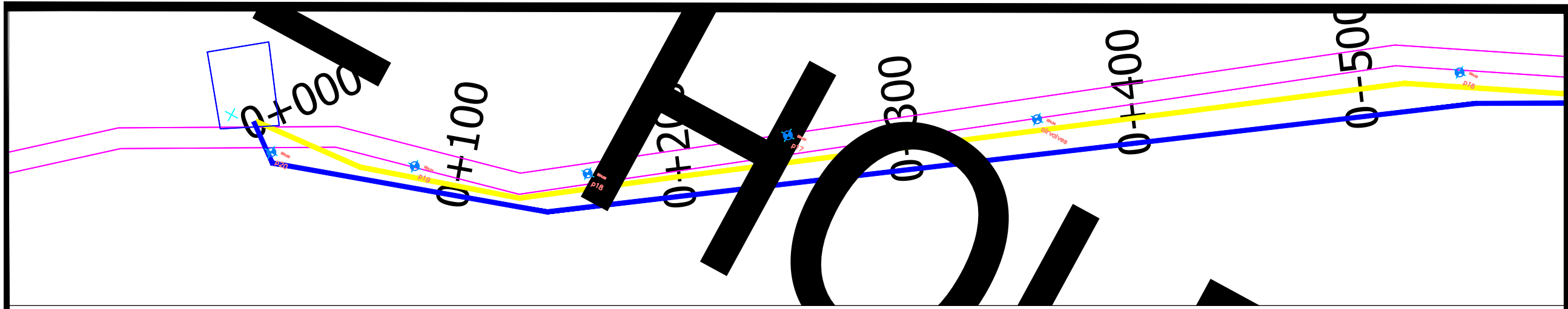
Name of the Tenderer:[insert complete name of the Tenderer]_____*

*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]*

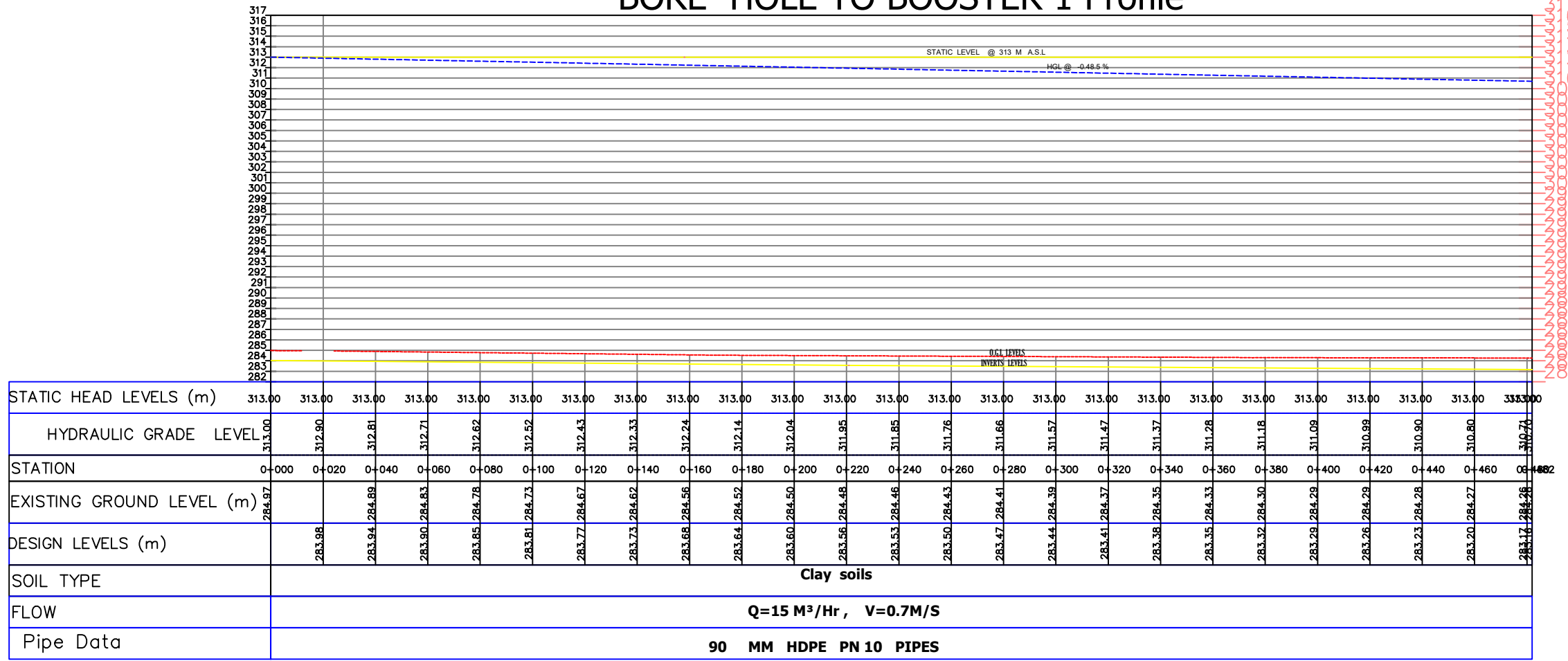
Title of the person signing the Tender: [insert complete title of the person signing the Tender]

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], [insert year]



BORE HOLE TO BOOSTER 1 Profile



LEGEND

EXISTING ROADS	
AIR-STRIP	
BUILDINGS	
EXISTING PIPELINE	
PROPOSED PIPELINE	
LAGAS/RIVERS	
FENCE/COMPOUNDS	

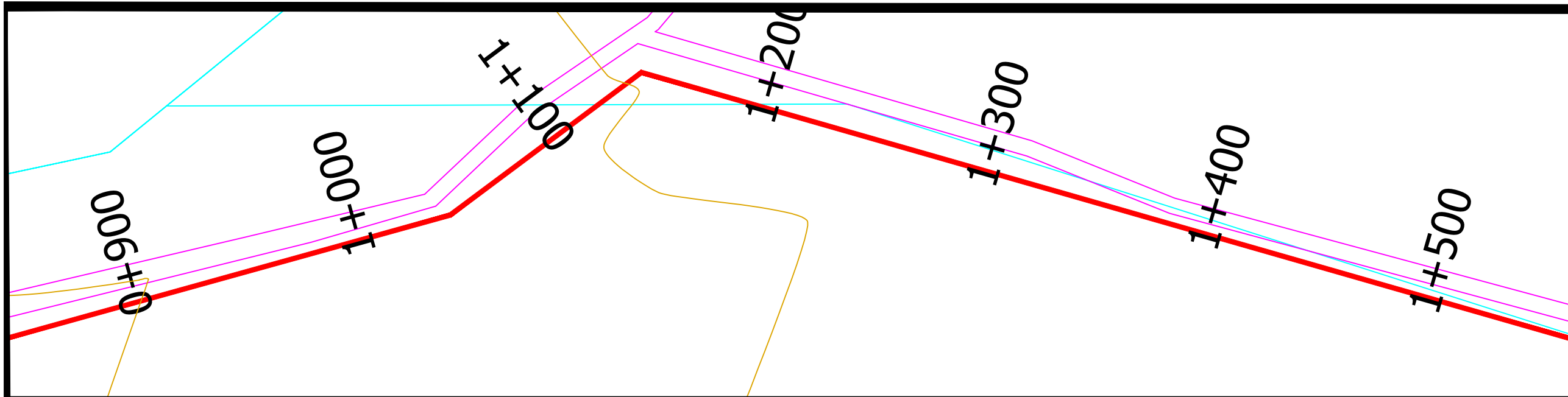


SCALE
 HORIZONTAL SCALE-1:2,000
 VERTICAL SCALE-----1:100

NOTES

1. All dimensions are in mm unless otherwise specified
2. All dimensions to be read off and not scaled.
3. Any discrepancies with dimensions to be notified to the Engineer before commencement of work.

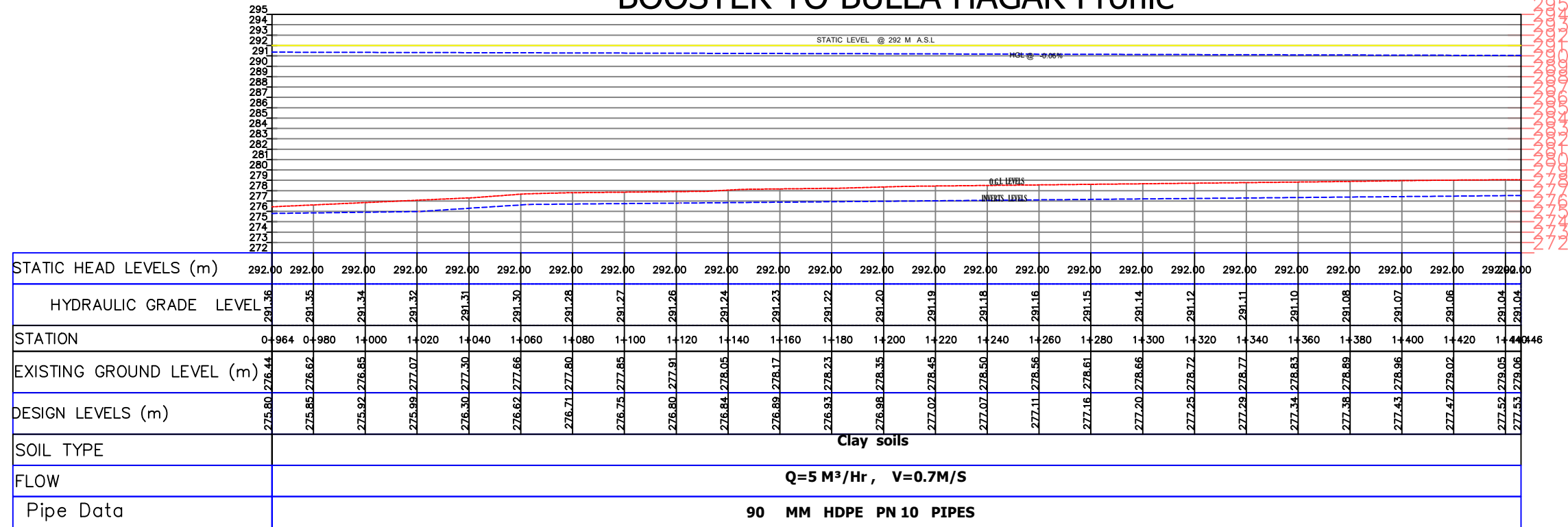
 CLIENT REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	 ENGINEER REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY:	J.MUE	PROJECT TITLE PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT Drg. Title:BORE HOLE TO BOOSTER 1 RISING MAIN	Scale:	As shown
		SURVEYED BY:	G. N.N		Date:	JULY .2023
		DRAWN BY:	G.N.N		Drg. No.	WD/WSP/02/01
		Approved By:	Eng. NDUNGU		SHEET 001	Sheet Size. A3



LEGEND

- EXISTING ROADS —
- AIR-STRIP —
- BUILDINGS
- EXISTING PIPELINE —
- PROPOSED PIPELINE —
- LAGAS/RIVERS —
- FENCE/COMPOUNDS —

BOOSTER TO BULLA HAGAR Profile



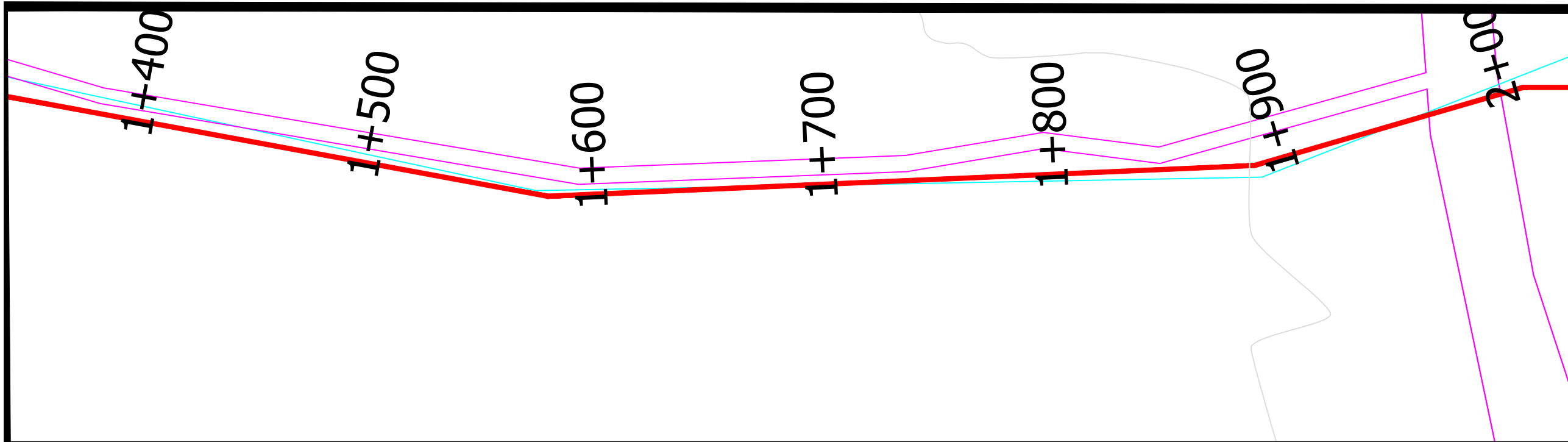
SCALE

HORIZONTAL SCALE-1:2,000
VERTICAL SCALE-----1:100

NOTES

- All dimensions are in mm unless otherwise specified
- All dimensions to be read off and not scaled.
- Any discrepancies with dimensions to be notified to the Engineer before commencement of work.

 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY:	J.MUE	PROJECT TITLE PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT Drg. Title:BOOSTER TO BULLA HAGAR RISING MAIN	Scale:	As shown
		SURVEYED BY:	G. N.N		Date:	JULY . 2023
		DRAWN BY:	G.N.N		Drg. No.	WD/WSP/03/03
		Approved By:	Eng. NDUNGU		SHEET 003	Sheet Size: A3



LEGEND

- EXISTING ROADS —
- AIR-STRIP —
- BUILDINGS
- EXISTING PIPELINE —
- PROPOSED PIPELINE —
- LAGAS/RIVERS —
- FENCE/COMPOUNDS —

BOOSTER TO BULLA HAGAR Profile

	295	294	293	292	291	290	289	288	287	286	285	284	283	282	281	280	279	278	277	276	275	274					
STATIC HEAD LEVELS (m)	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00	292.00					
HYDRAULIC GRADE LEVEL	291.04	291.03	291.02	291.00	290.99	290.98	290.96	290.95	290.94	290.92	290.91	290.90	290.88	290.87	290.86	290.84	290.83	290.82	290.80	290.79	290.78	290.76	290.75	290.74	290.72	290.72	
STATION	1+446	1+460	1+480	1+500	1+520	1+540	1+560	1+580	1+600	1+620	1+640	1+660	1+680	1+700	1+720	1+740	1+760	1+780	1+800	1+820	1+840	1+860	1+880	1+900	1+920	928	
EXISTING GROUND LEVEL (m)	277.53	277.56	277.61	277.65	277.70	277.74	277.79	277.83	277.88	277.92	277.97	278.01	278.09	278.19	278.28	278.37	278.47	278.56	278.66	278.75	278.84	278.94	279.03	279.10	279.16	279.19	
DESIGN LEVELS (m)	277.53	277.56	277.61	277.65	277.70	277.74	277.79	277.83	277.88	277.92	277.97	278.01	278.09	278.19	278.28	278.37	278.47	278.56	278.66	278.75	278.84	278.94	279.03	279.10	279.16	279.19	
SOIL TYPE	Clay soils																										
FLOW	Q=5 M ³ /Hr, V=0.7M/S																										
Pipe Data	90 MM HDPE PN 10 PIPES																										



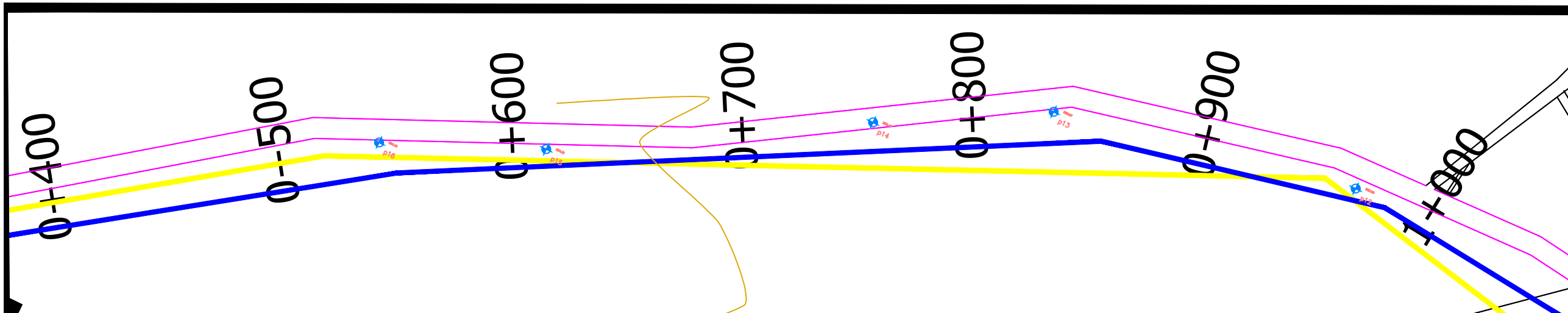
SCALE

HORIZONTAL SCALE-1:2,000
VERTICAL SCALE-----1:100

NOTES

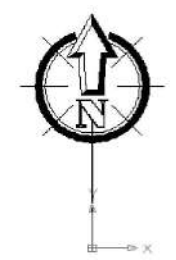
1. All dimensions are in mm unless otherwise specified
2. All dimensions to be read off and not scaled.
3. Any discrepancies with dimensions to be notified to the Engineer before commencement of work.

CLIENT REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	ENGINEER REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY: J.MUE SURVEYED BY: G. N.N DRAWN BY: G.N.N Approved By: Eng. NDUNGU	PROJECT TITLE PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT Drg. Title:BOOSTER TO BULLA HAGAR RISING MAIN	Scale: Date: Drg. No.	As shown JULY . 2023 SHEET 004 Sheet Size. A3
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BORE HOLE TO BOOSTER 1 Profile

LEGEND	
EXISTING ROADS	
AIR-STRIP	
BUILDINGS	
EXISTING PIPELINE	
PROPOSED PIPELINE	
LAGAS/RIVERS	
FENCE/COMPOUNDS	



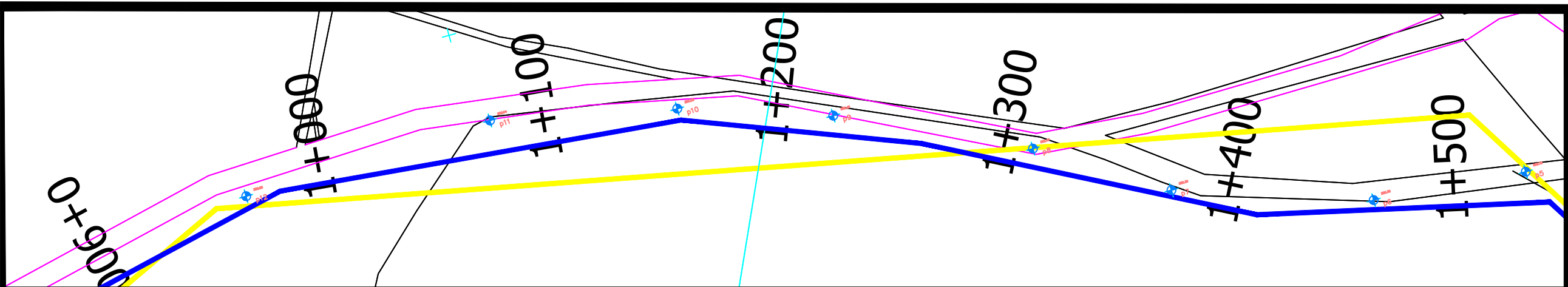
SCALE
 HORIZONTAL SCALE-1:2,000
 VERTICAL SCALE-----1:100

STATION	0+482	0+500	0+520	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+964			
STATIC HEAD LEVELS (m)	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00			
HYDRAULIC GRADE LEVEL	310.70	310.61	310.51	310.42	310.32	310.23	310.13	310.04	309.94	309.85	309.75	309.65	309.56	309.46	309.37	309.27	309.18	309.08	308.98	308.89	308.79	308.70	308.60	308.51	308.41	308.39		
EXISTING GROUND LEVEL (m)	284.26	284.26	284.25	284.24	284.23	284.22	284.21	284.19	284.12	284.02	283.92	283.82	283.72	283.61	283.51	283.42	283.36	283.30	283.29	283.29	283.20	283.11	283.03	282.98	282.93	282.92		
DESIGN LEVELS (m)	283.16	283.14	283.09	283.04	282.98	282.93	282.87	282.82	282.77	282.71	282.66	282.61	282.55	282.50	282.44	282.39	282.34	282.28	282.23	282.18	282.12	282.08	282.04	282.01	281.97	281.96		
SOIL TYPE	Clay soils																											
FLOW	Q=15 M ³ /Hr, V=0.7M/S																											
Pipe Data	90 MM HDPE PN 10 PIPES																											

NOTES

1. All dimensions are in mm unless otherwise specified
2. All dimensions to be read off and not scaled.
3. Any discrepancies with dimensions to be notified to the Engineer before commencement of work.

 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY:	J.MUE	PROJECT TITLE	Scale:	As shown
		SURVEYED BY:	G. N.N			PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT
		DRAWN BY:	G.N.N	Drg. Title:BORE HOLE TO BOOSTER 1 RISING MAIN	Drg. No.	
		Approved By:	Eng. NDUNGU		Sheet Size:	A3



BORE HOLE TO BOOSTER 1 Profile

LEGEND

- EXISTING ROADS —
- AIR-STRIP —
- BUILDINGS
- EXISTING PIPELINE —
- PROPOSED PIPELINE —
- LAGAS/RIVERS —
- FENCE/COMPOUNDS —



STATION	0+964	0+980	1+000	1+020	1+040	1+060	1+080	1+100	1+120	1+140	1+160	1+180	1+200	1+220	1+240	1+260	1+280	1+300	1+320	1+340	1+360	1+380	1+400	1+420	1+440	1+46		
STATIC HEAD LEVELS (m)	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00		
HYDRAULIC GRADE LEVEL	308.38	308.32	308.22	308.12	308.03	307.93	307.84	307.74	307.65	307.55	307.45	307.36	307.26	307.17	307.07	306.98	306.88	306.79	306.69	306.59	306.50	306.40	306.31	306.21	306.12	306.08		
EXISTING GROUND LEVEL (m)	282.92	282.87	282.84	282.80	282.76	282.72	282.68	282.65	282.61	282.57	282.53	282.50	282.47	282.47	282.48	282.49	282.47	282.50	282.47	282.43	282.38	282.36	282.36	282.36	282.37	282.37		
DESIGN LEVELS (m)	281.96	281.83	281.89	281.85	281.82	281.78	281.74	281.70	281.67	281.63	281.60	281.56	281.52	281.58	281.65	281.61	281.56	281.52	281.48	281.43	281.39	281.35	281.30	281.26	281.21	281.20		
SOIL TYPE	Clay soils																											
FLOW	$Q=15 \text{ M}^3/\text{Hr}, V=0.7\text{M/S}$																											
Pipe Data	90 MM HDPE PN 10 PIPES																											

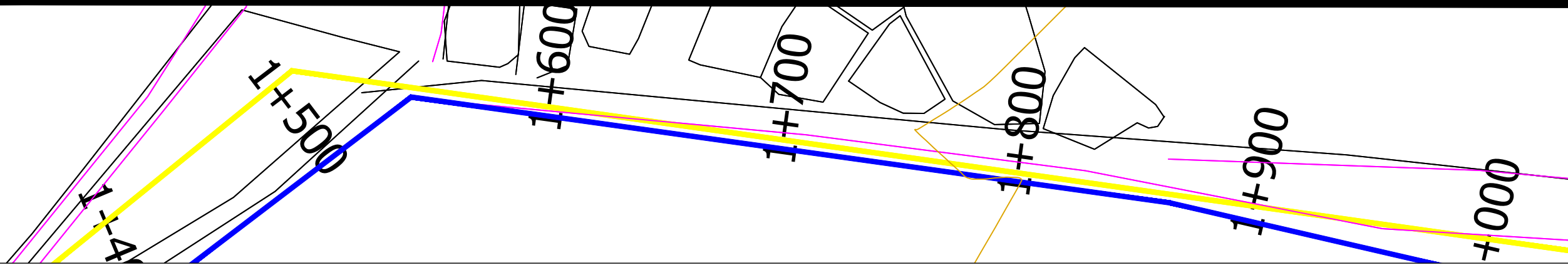
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VERTICAL SCALE-----1:100

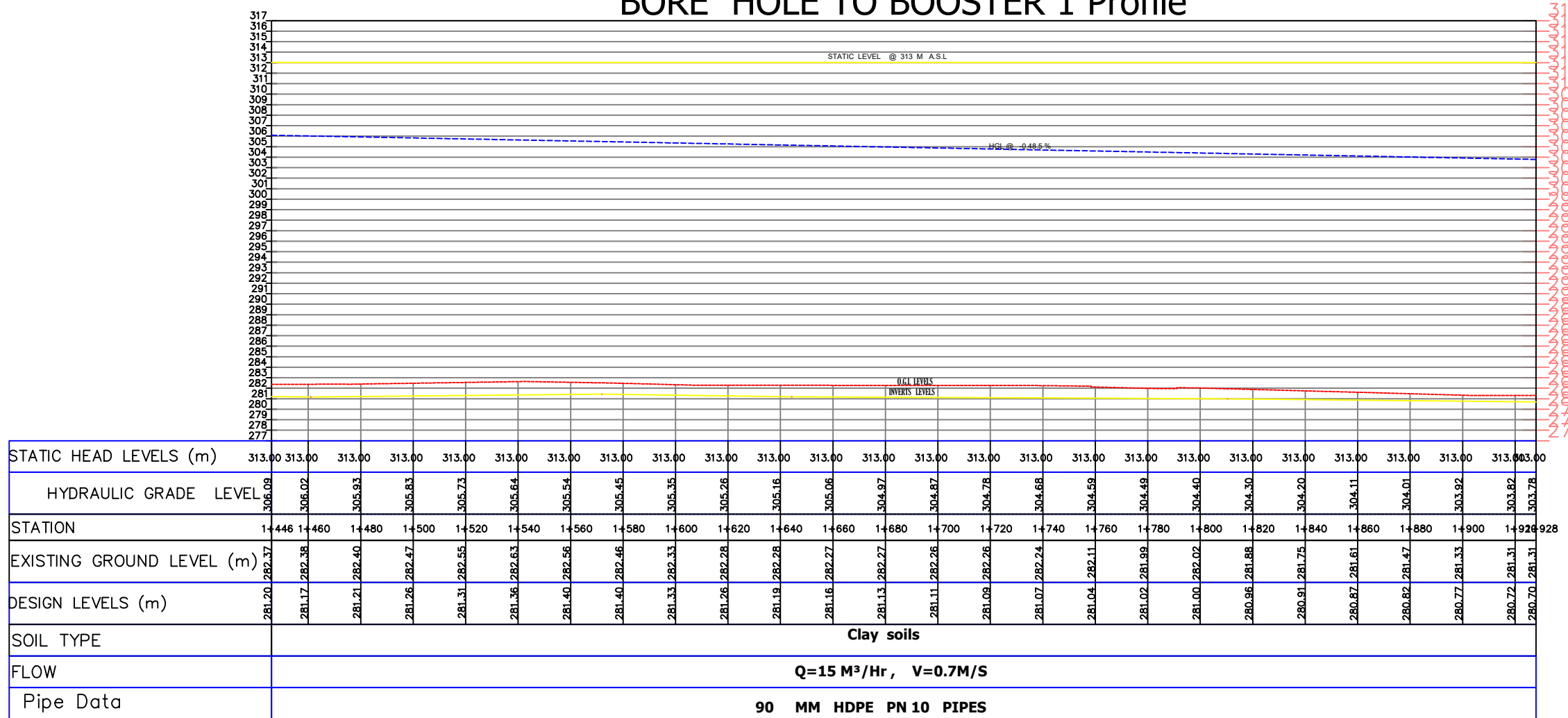
NOTES

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3. Any discrepancies with dimensions to be notified to the Engineer before commencement of work.

 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY:	J.MUE	PROJECT TITLE PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT Drg. Title:BORE HOLE TO BOOSTER 1 RISING MAIN	Scale:	As shown
		SURVEYED BY:	G. N.N		Date:	JULY . 2023
		DRAWN BY:	G.N.N		Drg. No.	WD/WSP/02/03
		Approved By:	Eng. NDUNGU		SHEET 003	Sheet Size. A3

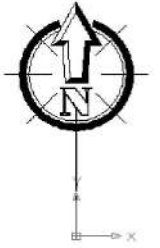


BORE HOLE TO BOOSTER 1 Profile



LEGEND

- EXISTING ROADS —
- AIR-STRIP —
- BUILDINGS
- EXISTING PIPELINE —
- PROPOSED PIPELINE —
- LAGAS/RIVERS —
- FENCE/COMPOUNDS —





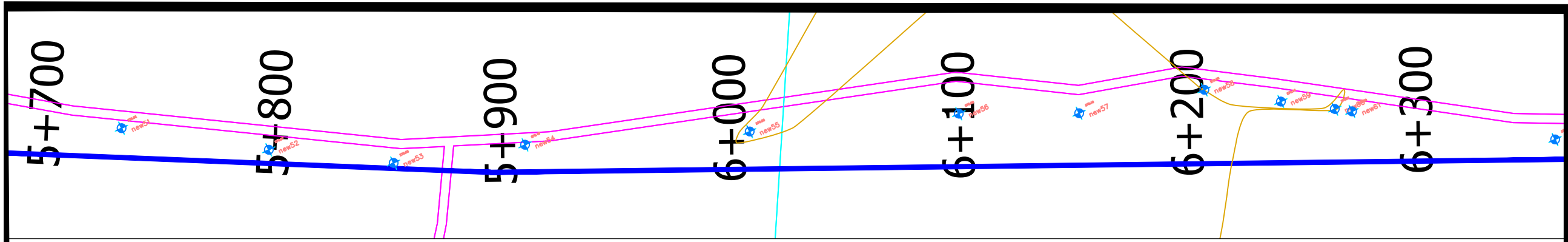
SCALE

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VERTICAL SCALE-----1:100

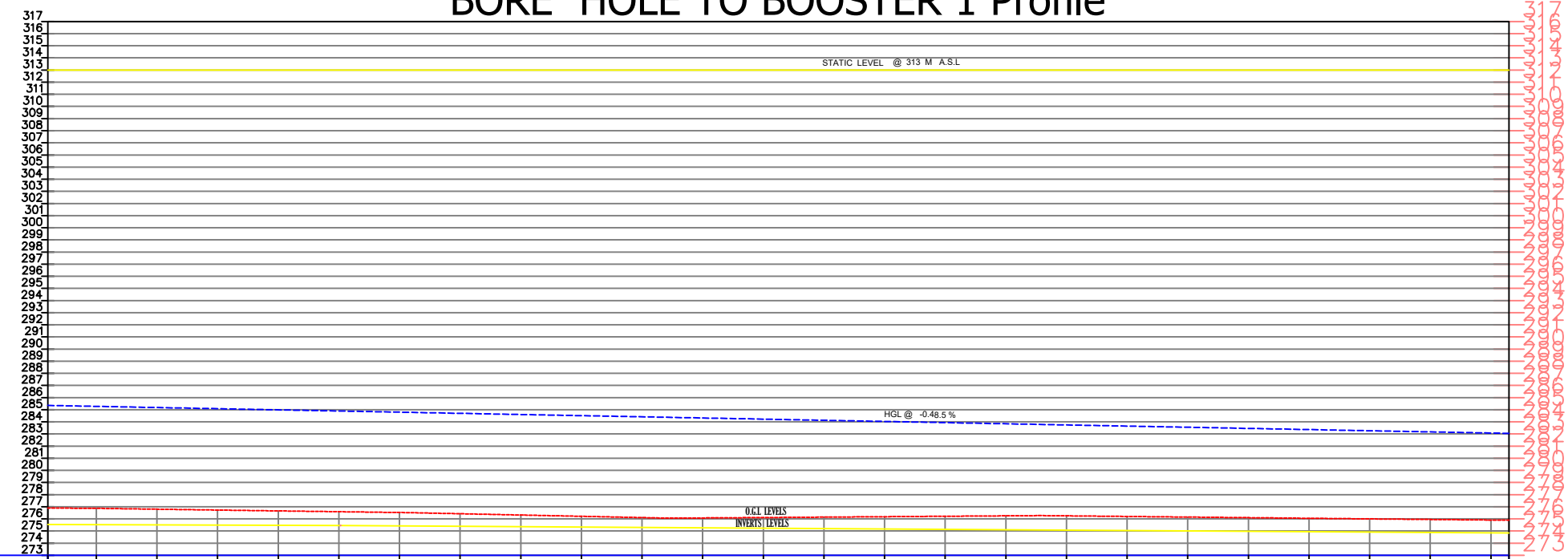
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 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	 REPUBLIC OF KENYA NORTHERN WATER WORKS DEVELOPMENT AGENCY	DESIGNED BY:	J.MUE	PROJECT TITLE	Scale:	As shown		
		SURVEYED BY:	G. N.N			PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT	Date:	JULY . 2023
		DRAWN BY:	G.N.N				Drg. No. WD/WSP/02/04	SHEET 004
		Approved By:	Eng. NDUNGU					Sheet Size. A3
Drg. Title:BORE HOLE TO BOOSTER 1 RISING MAIN								



BORE HOLE TO BOOSTER 1 Profile



STATION	5+784	5+800	5+820	5+840	5+860	5+880	5+900	5+920	5+940	5+960	5+980	6+000	6+020	6+040	6+060	6+080	6+100	6+120	6+140	6+160	6+180	6+200	6+220	6+240	6+260	6+280	6+300	
STATIC HEAD LEVELS (m)	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	313.00	
HYDRAULIC GRADE LEVEL	285.35	285.27	285.18	285.08	284.99	284.89	284.80	284.70	284.61	284.51	284.41	284.32	284.22	284.13	284.03	283.94	283.84	283.74	283.65	283.55	283.46	283.36	283.27	283.17	283.08	282.98	282.88	
EXISTING GROUND LEVEL (m)	276.89	276.87	276.80	276.73	276.66	276.59	276.53	276.42	276.32	276.21	276.11	276.08	276.11	276.15	276.18	276.22	276.25	276.25	276.20	276.15	276.10	276.05	276.00	275.95	275.90	275.85	275.80	
DESIGN LEVELS (m)	275.54	275.53	275.51	275.49	275.47	275.45	275.42	275.39	275.36	275.32	275.29	275.26	275.23	275.20	275.17	275.13	275.10	275.07	275.04	275.01	274.97	274.94	274.91	274.88	274.85	274.84	274.84	
SOIL TYPE	Clay soils																											
FLOW	Q=15 M ³ /Hr, V=0.7M/S																											
Pipe Data	90 MM HDPE PN 10 PIPES																											

LEGEND

- EXISTING ROADS
- AIR-STRIP
- BUILDINGS
- EXISTING PIPELINE
- PROPOSED PIPELINE
- LAGAS/RIVERS
- FENCE/COMPOUNDS

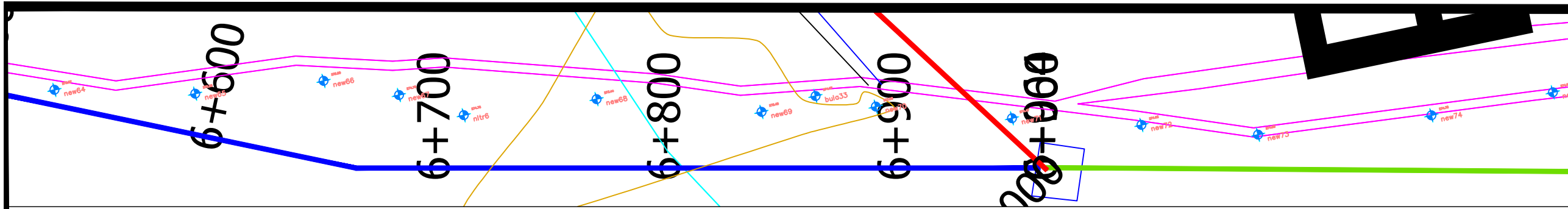


SCALE
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 VERTICAL SCALE-----1:100

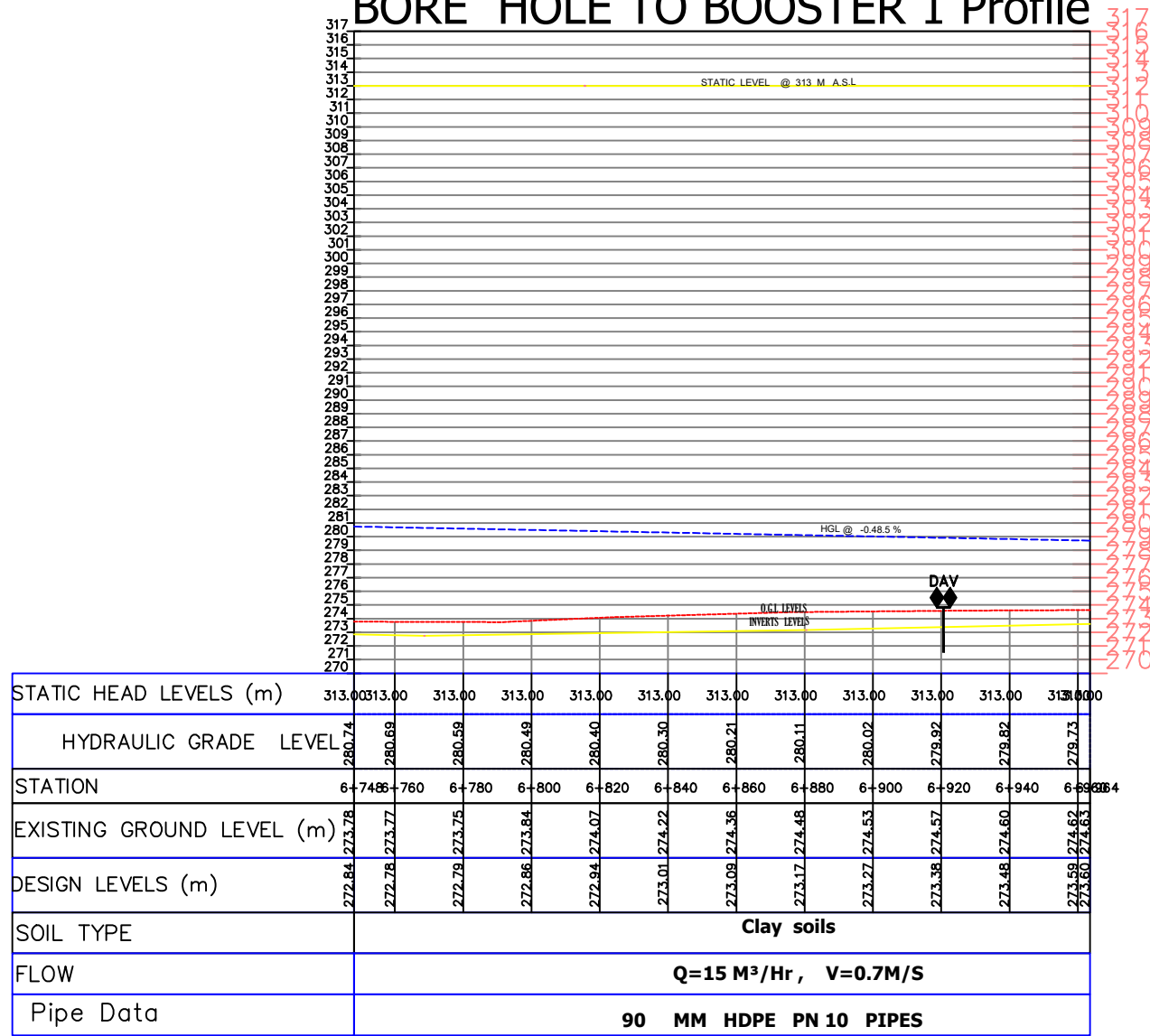
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		SURVEYED BY:	G. N.N		PROPOSED BILATULAMIN - BIAD WATER SUPPLY PROJECT	Date:	JULY . 2023	
		DRAWN BY:	G.N.N			Drg. Title:BORE HOLE TO BOOSTER 1 RISING MAIN	Drg. No.	SHEET 013
		Approved By:	Eng. NDUNGU				WD/WSP/02/13	Sheet Size. A3

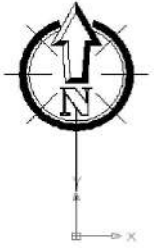


BORE HOLE TO BOOSTER 1 Profile



LEGEND

- EXISTING ROADS —
- AIR-STRIP —
- BUILDINGS
- EXISTING PIPELINE —
- PROPOSED PIPELINE —
- LAGAS/RIVERS —
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SCALE

HORIZONTAL SCALE-1:2,000
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		DRAWN BY:	G.N.N		Drg. No.	WD/WSP/02/15
		Approved By:	Eng. NDUNGU		Sheet Size:	A3